SAMSUNG

SAMSUNG Home Appliance Service

SERVICE GUIDE

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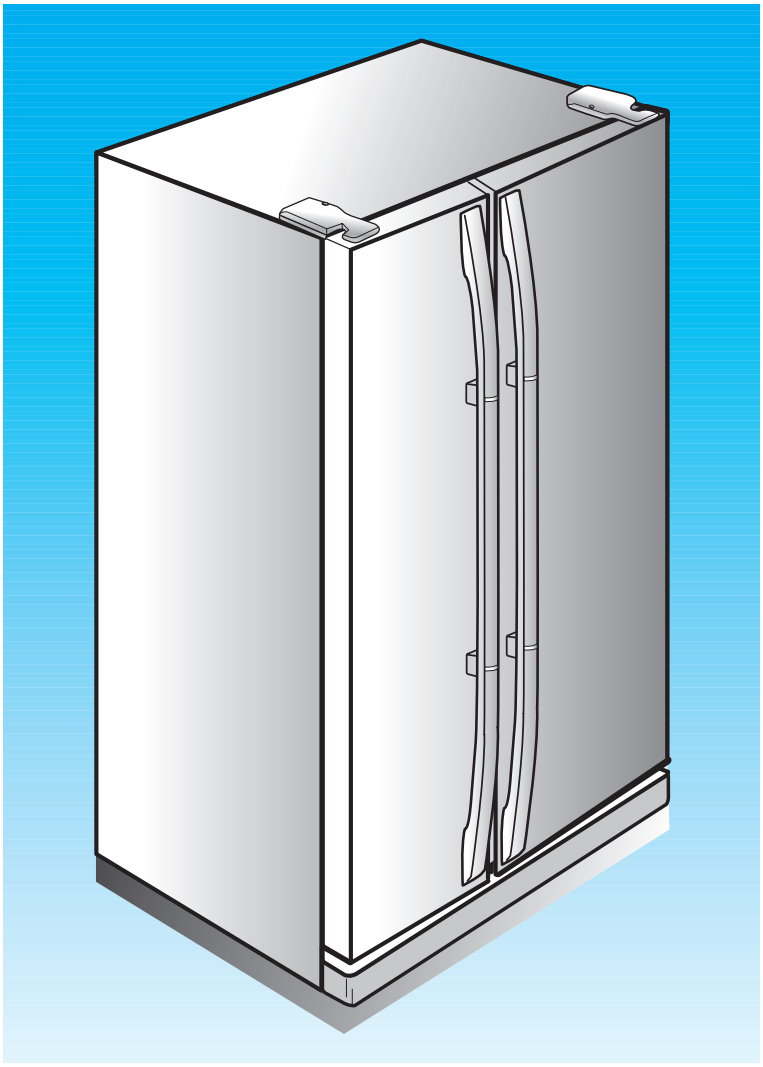
(http://www.e4buyer.com/refrigerator)

SIDE-BY-SIDE REFRIGERATOR



Model:

RS20NCSL
RS20NCSW
RS20NESL
RS20NESW

WARNING

IMPORTANT SAFETY NOTICE

The service guide is for service men with adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or dealer cannot be responsible for the interpretation of this information.

SAMSUNG ELECTRONICS

Technical Service Guide

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1. SAFETY WARNINGS

● Pull the power plug out already for the change or repair of electric parts.
→ Be careful the electric shock.

● When exchanging the parts, use the correct parts.
→ Check the model name, rating voltage, rating current, running temperature symbols.

● When troubleshooting, connect firmly the types of harness.
→ Make not to be separated when some power is imposed.

● Check the traces of water infiltration at the electric parts.
→ If there is a trace of water infiltration, exchange or tape the parts.

● Check the assemble status of parts after troubleshooting.
→ It should be done indiscriminately as before the repair.

● Check the use circumstance of refrigerator.
→ If the refrigerator is installed at the place that is damp or wet, or status of installation is unstable, change the installation place.

● Do earth in case of need.
→ Particularly, Be sure to earth when there is a risk of an electric leakage by humidity or wetness.

● Do not use multi plugs in a plug socket at the same time.
Check the power cord and socket is damaged, pressed, squeezed, or fired.
→ If the plug or plug socket is damaged, repair or exchange that immediately.

● Do not store the foods unstable or bottles in the freezing room.

● Do not repair the refrigerator by user himself.

● Do not store another materials except the foods.
→ Drugs or scientific materials : difficult to keep a precise temperature.
→ The inflammables(alcohol, benzene, ether, LP gas, butane gas etc.): have a risk of explosion.

1. SAFETY WARNINGS

CAUTION / WARNING SYMBOLS DISPLAYED

Warning	Indicates that a danger of death or serious injury exists.
Caution	Indicates that a risk of personal injury or material damage exists.

SYMBOLS

means “Prohibition”.
means “Do not disassemble”.
means “No contact”.
means ”The things to be followed”.
means “Power cord should be unplugged from the consent”
means “Earth to prevent Electric shock”.

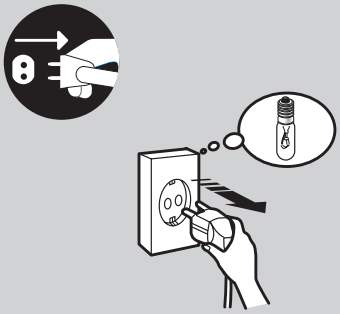
Caution

Use the rated components on the replacement.

- ***Check the correct model, rated voltage, rated current, operating temperature and so on.***

Pull the power plug out to exchange the interior lamp of the refrigerator.

- ***It may cause electric shock.***



On repair, make sure that the wires such as harness are bundled tightly.

- ***Bundle tightly wires in order not to be detached by the external force and then not to be wetted.***

On repair, remove completely dust or other things of housing parts, harness parts, and check parts.

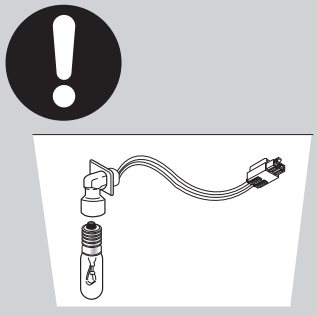
- ***Cleaning may prevent the possible fire by tracking or short.***

After repair, check the assembled state of components.

- ***It must be in the same assembled state when compared with the state before disassembly.***

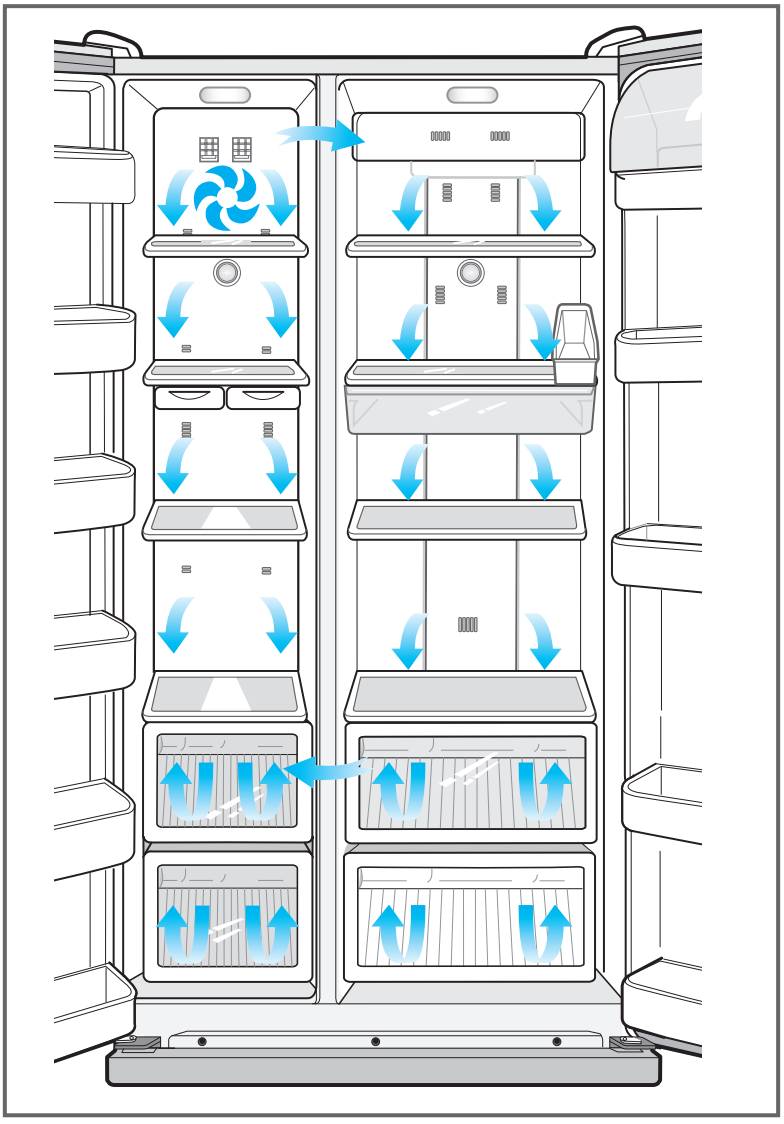
Check if there is any trace indicating the permeation of water.

- ***If there is that kind of trace, change the related components or do the necessary treatment such as taping using the insulating tape.***



2. INSTRUCTION

- **A newly developed SAMSUNG side by side refrigerator has the following characteristics.**



1) Multi-Flow System

- Cool air circulates through multiple vents on each shelf level. This provides even distribution of cooling inside of freezer/refrigerator and keeps food fresher for longer.

2) High humidity for fresher food

- You can keep food, fruit and vegetables fresh for longer because your refrigerator supplies highly humidified cold air.

3) Door Alarm

- When the refrigerator door is left open for more than two minutes, a musical alarm is automatically triggered. This feature helps you save electricity and preserve stored foods.

3. INSTALLATION

1) To protect refrigerator in movement
Use padded hand truck as shown. If entrance width is less than 30 ″, remove doors prior to installation and reattach doors according to procedure below.

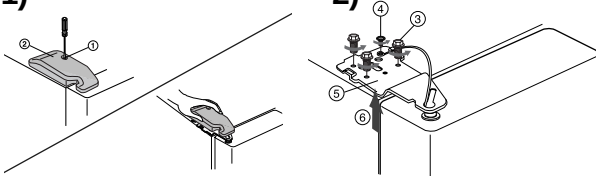
2) Remove all protective tape and pad in refrigerators.
Please adjust the clearance between the doors.

3) Set the temperature control to the temperature and wait for an hour.
The refrigerator should get slightly chilled and the motor runs smoothly.

4) Once the refrigerator temperature is sufficiently cool
You can store food in the refrigerator. After starting the refrigerator, it takes a few hours to reach the appropriate temperature.

● Disassemble the refrigerator

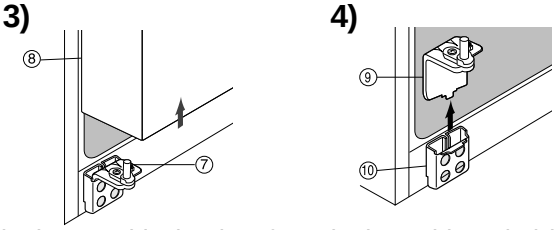
1) **2)**



1) With the door closed, disassemble screw(①) by using (+) screw driver and then disassemble the upper hinge cover(②).

2) Disassemble bolts (③) and screws (④) to the counter-clockwise by using a tool, and take off the upper hinge (⑤) along the arrow (⑥). Take care when you disassemble the door to ensure that it does not fall on you.

3) **4)**

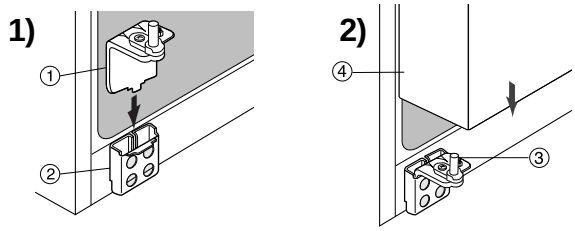


3) Disassemble the door from the lower hinge (⑦) by lifting the door (⑧).

4) Disassemble the lower hinge (⑨) from the bracket lower hinge (⑩) by lifting the lower hinge (⑨) in the direction of the arrow.

● Assemble the refrigerator

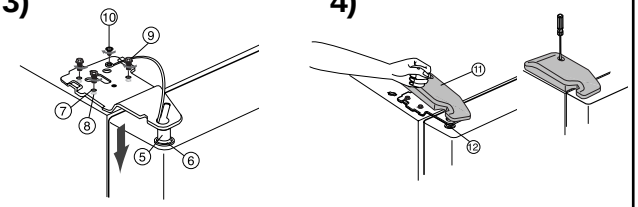
1) **2)**



1) Insert the lower hinge (①) in the bracket lower hinge (②).

2) Assemble the door (④) in the lower hinge (③).

3) **4)**



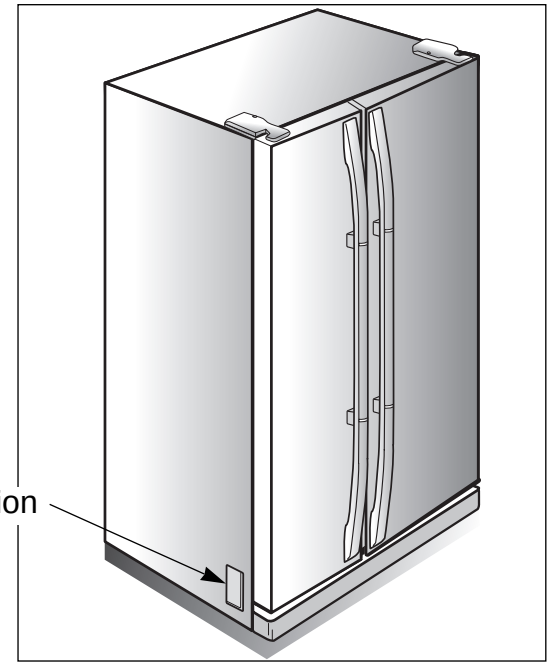
3) Insert the upper hinge shaft (⑤) into the hole (⑥). After leveling between the upper hinge hole (⑦) and the hole of the refrigerator (⑧), assemble bolts (⑨) and screws (⑩) to the clockwise by using a tool.

4) Put the front part of the upper hinge cover (⑪) on the front part of the upper hinge (⑫) and assemble, starting with the front part of the upper hinge cover. Assemble the screw to the clock wise by using a tool.

4. NOMENCLATURE

R S 20 N C SW

- SW : Color
  - SW : Snow White
  - SL : Stainless Looking
- C : Handle Type
  - C ; Sky Bar Handle
  - E ; Deluxe Bar Handle
- N : Option
  - N : Nothing
- 20 : Capacity ; Cu. ft
- S : Door Type
  - S - Side By Side
- R : Product ; R - Refrigerator



5. SPECIFICATIONS

5-1. Model Specification

Items		Specification				
Model Name		RS20N***				
Volume capacity	Total Volume	496 ℓ(17.5 cu.ft)				
	Freezer Volume	188 ℓ(6.6 cu.ft)				
	Refrigerator Volume	308 ℓ(10.9 cu.ft)				
Outer dimensions(width x depth x height)		850mm × 724mm × 1722mm				
Rated frequency〔Hz〕		60	60	50	50/60	50
Rated voltage〔V〕		110~115	127	220	220	230
Rated consumption of Comp.〔W〕		140	125	120	140	125
Rated consumption of Electric heater〔W〕		394				
Refrigerator type		Frost free				
Refrigerant		HFC - 134a				
Refrigerant quantity		190gr				
Freezing Capacity		* ***				
Products weight		106kg				

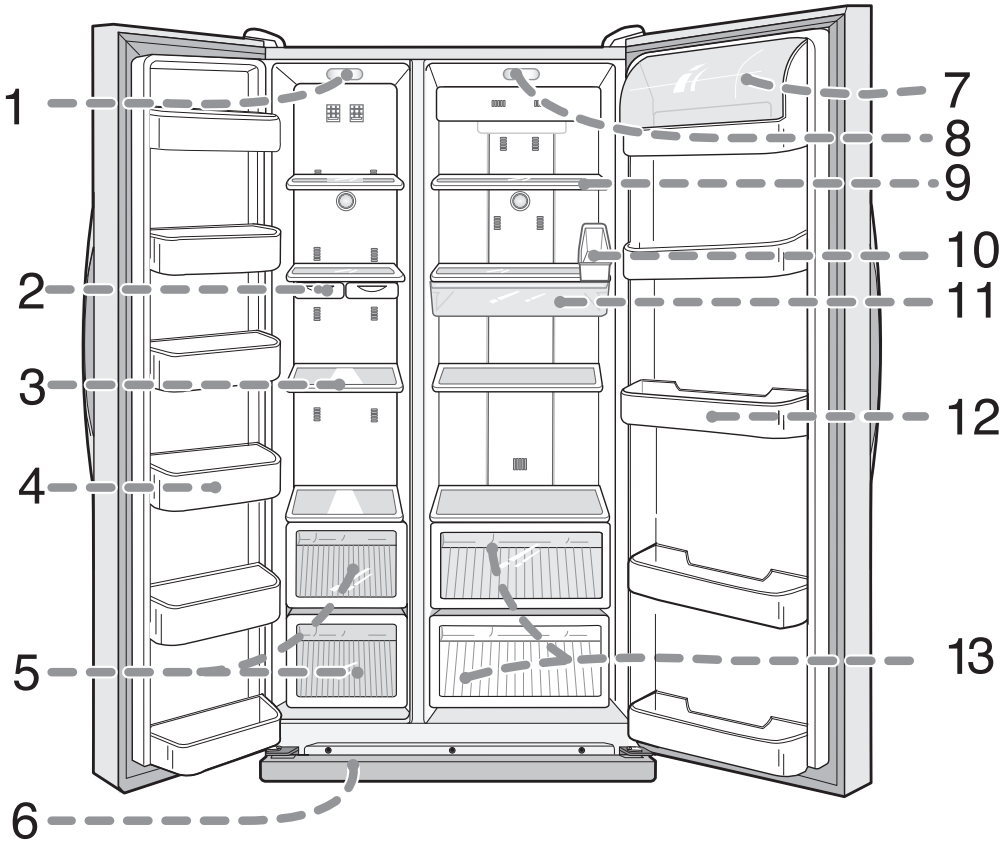
5-2. Electric Parts Specification

Items				Specification				
Model Name				RS20N***				
Performance of freezer				* ***				
Freezing parts	Compressor		Type	110V/60Hz	127V/60Hz	220V/50Hz	220V/50,60Hz	230V/50Hz
				MK183CL2U/EH1	MK183PL2U/EO1	DK190KT2U/EO1	SK190HL2U/EO1	MK183QL2U/EO1
			Operation type	R.S.C.R				
			Sealing oils	FREOL α - 15 (ESTER)				
	Cooler		Freezer	SPLIT FIN TYPE				
	Condensing method			Force and natural convection method				
	Drying agent			MOLECULAR SIEVE XH-9				
	Capillary tube			0.82×3200, 5.5 kg/cm²				
	Refrigerant			HFC-134a				
Inner Temperature detection parts	Freezer	Types	Freezer temp.	ON(℃)		OFF(℃)		
		Thermistor (F-sensor) 502AT	Colder	-24.0		-26.0		
			Normal	-19.0		-21.0		
			Cold	-15.0		-17.0		
	Refrigerator	Types	Refrigerator temp.	ON(℃)		OFF(℃)		
		Thermistor (R-sensor) 502AT	Colder	2.0		0.0		
			Normal	4.0		2.0		
			Cold	7.0		5.0		
Parts related defrost	Defrostperiod	Period of initial defrost (F defrost)		4 hours ± 10 mins				
		Defrost period of freezer		6~11 hours(Variable according to the use conditions)defrost				
		Pause		7 ± 2 minutes				
	Defrost sensor	F-defrost sensor	Types	THERMISTOR (PX41C)				
			Spec	5.0kΩ at 25℃				
	Temperature fuse		Rating	AC 250V 10A				
			Operation temp.	77 $^{+0}_{-5}$ ℃				

Items			Specification				
Electricparts	F-room defrost heater	Conducting at F defrosting	200W				
	F room heater sub	Conducting at F defrosting	60W				
	F room heater glass	Conducting at F defrosting	130W				
	R-room cover damper		3W				
	R room electrically driven damper		1W				
	Condenser for Comp.(monolithic)	Running	250VAC,12㎌	250VAC,12㎌	350VAC,5㎌	350VAC,5㎌	350VAC,5㎌
		Start	-	-	-	-	-
	Start relay	Type	J531Q32E4R7M1802	J531Q32E4R7M1802	J531Q34E220M3502	J531Q34E220M3502	J531Q35E330M3852
		Action	Initial resistance: 68Ω ±20% (Ambient temperature : 25℃)				
	Overload relay	Type	4TM437RHBYY-53	4TM437RHBYY-53	4TM317SHBYY-53	4TM317SHBYY-53	4TM265RHBYY-53
		ON temperature	130 ± 5℃				
		OFF temperature	69 ± 9℃				
	L.V.T(LOW VOLTAGE TRANSFORMER)		110~115V/60Hz	127V/60Hz	220V/50Hz	230~240V/50Hz	
	F room cooling fan motor		DC 12V DREP3030LA 0.3A				
	Comp. Cooling fan motor		DC 12V DRCP3030LA 0.24A				
	Freezer interior light		30W (110~127V)		25W (220~230V)		
	Refrigerator interior light		30W (110~127V)		25W (220~230V)		
	Door switch		AC 250V 0.5A×2EA				
	Supply cord		TO BE FOLLOWED LOCAL STANDARD				
	Grounding screw		BSBN (Bronze screw)×4EA				

6. INTERIOR VIEWS AND DIMENSIONS

6-1. The Name of Each Part



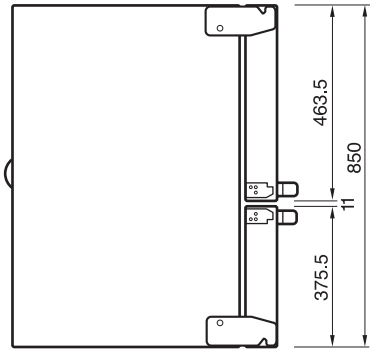
Freezer

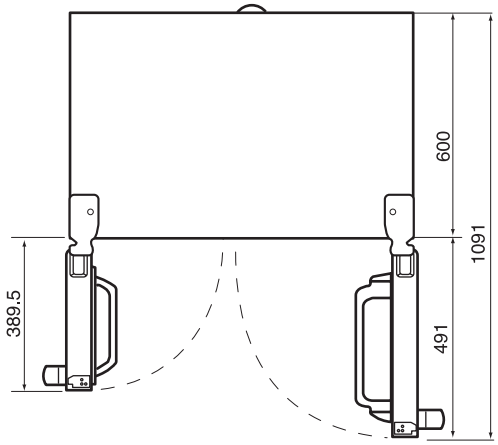
Ⅰ Interior light
② Ice tray
③ Shelf
④ Food Guard
⑤ Drawer
⑥ Leg cover

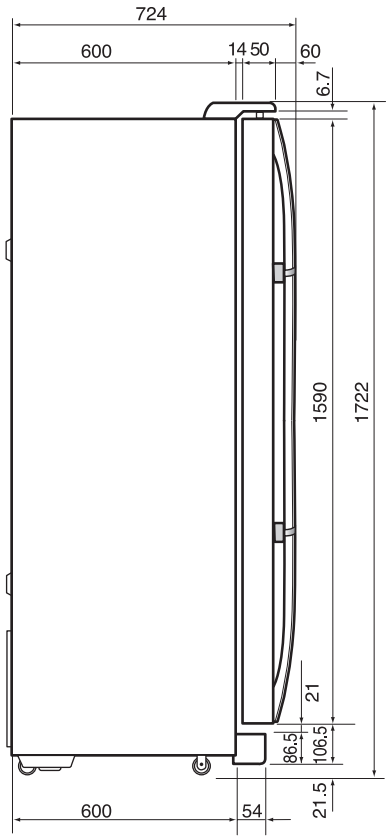
Refrigerator

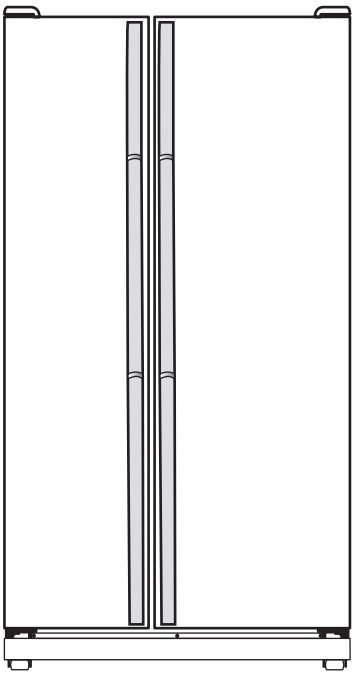
⑦ Dairy compartment
⑧ Interior light
⑨ Shelf
⑩ Egg tray
⑪ Fresh container(option)
⑫ Food Guard
⑬ Vegetable and fruit drawer

6-2. Dimensions of Unit





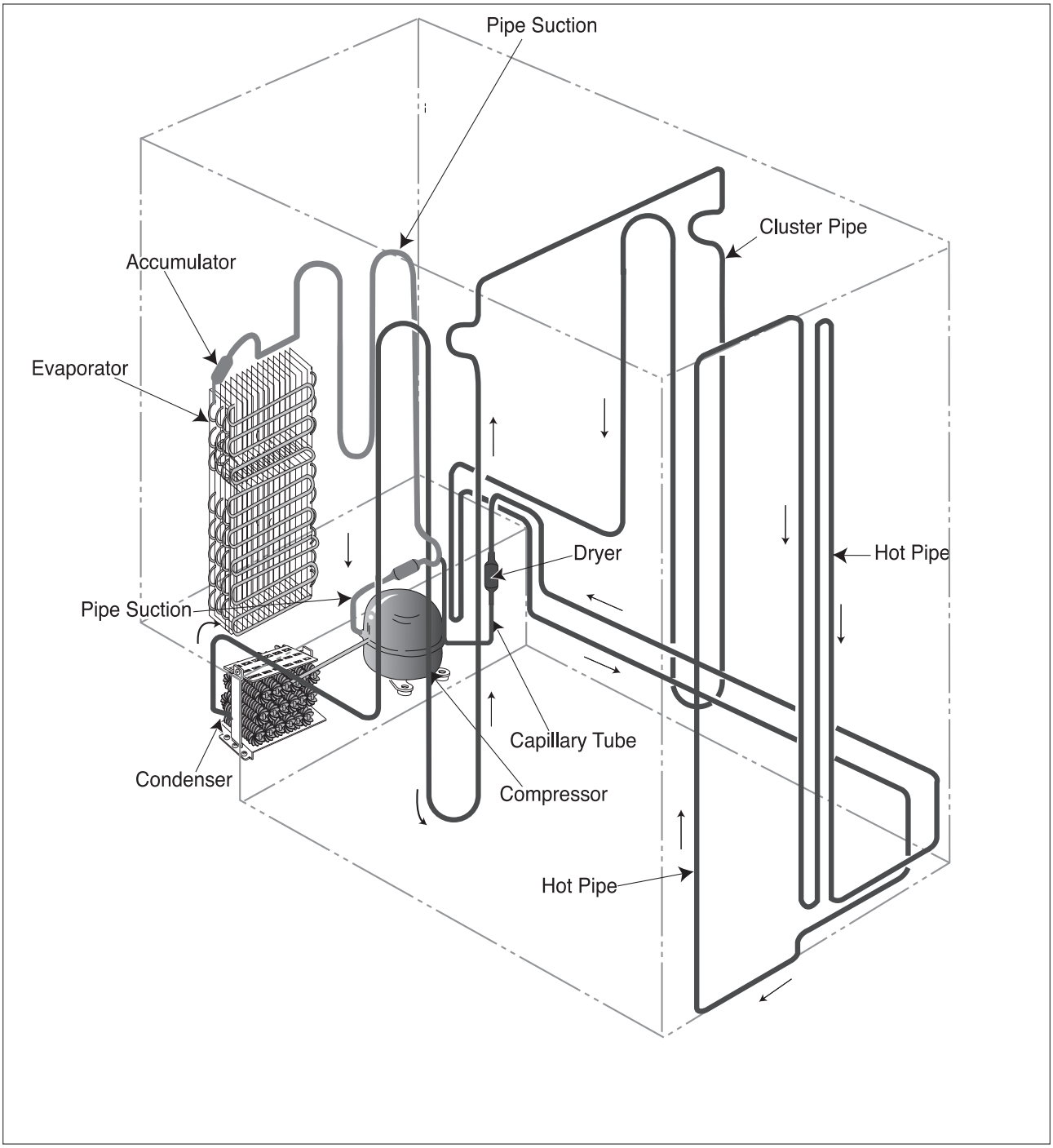




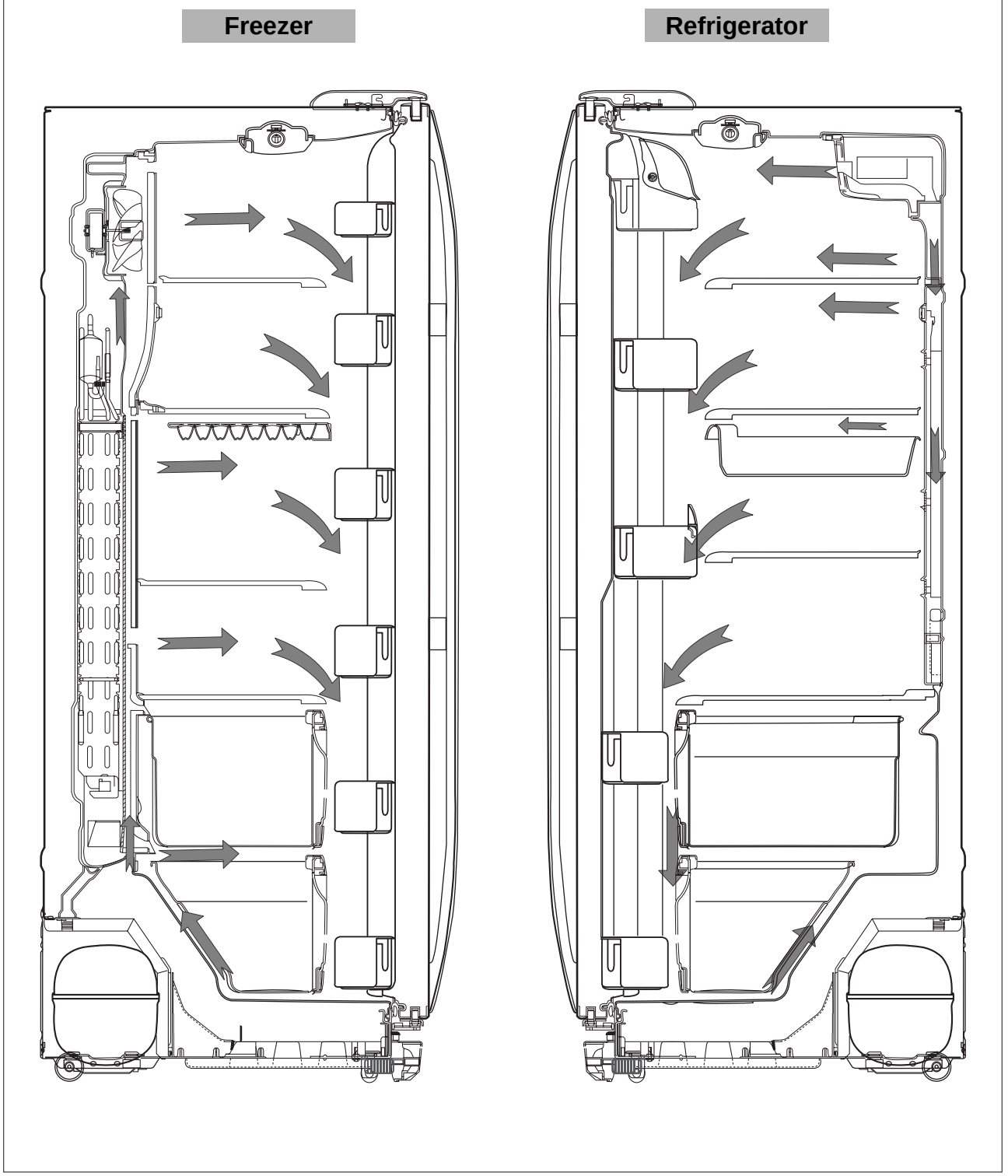
7. FREEZING CYCLE AND COOL AIR CIRCULATION ROUTE

7-1. Freezing Cycle

Compressor →Condenser →Pipe cluster →Pipe hot →Dryer →Capillary tube →
Evaporator →Accumulator →Pipe suction → Compressor



7-2. Cooling Air Circulation



8. MECHANICAL DISASSEMBLY

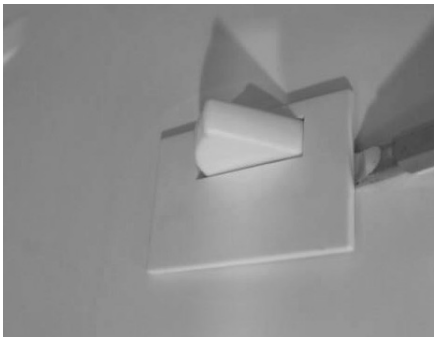
8-1. Accessories for storage and parts for lightening

Door Gasket

The door gasket is set into groove on door liner.
1) Open the door.
2) Grasp the gasket and pull it out from the door liner.

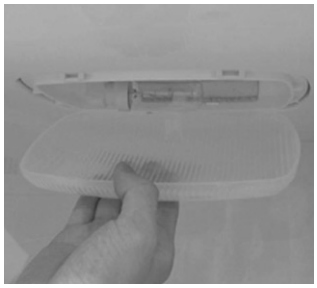
LIGHT SWITCHES

The unit have two light switches on the side wall of freezer & refrigerator.
1) Use a small flat-blade screw driver to unlock the hook and pull the switch out until the wire connector is exposed.



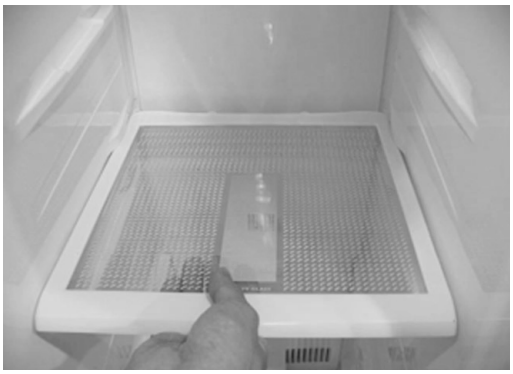
LIGHTS

The light of freezer & refrigerator are located at upper side of each compartment.
1) Remove the screws.
2) Remove the lamp cover by unlocking the hook.



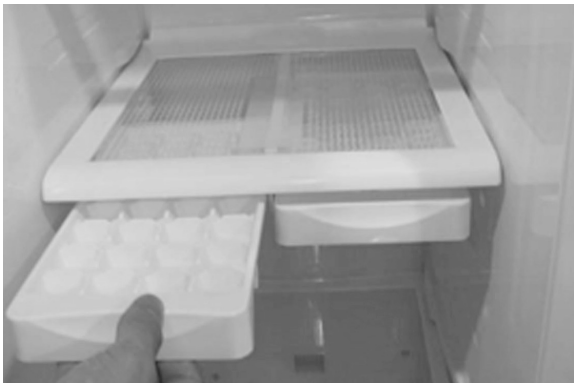
SHELVES

1) Pull the shelf out as far as it goes.
2) Lift it up and pull it out from the unit.



ICE TRAYS

The ice tray is located at bottom of freezer shelf-mid.
1) Pull the tray out by sliding.

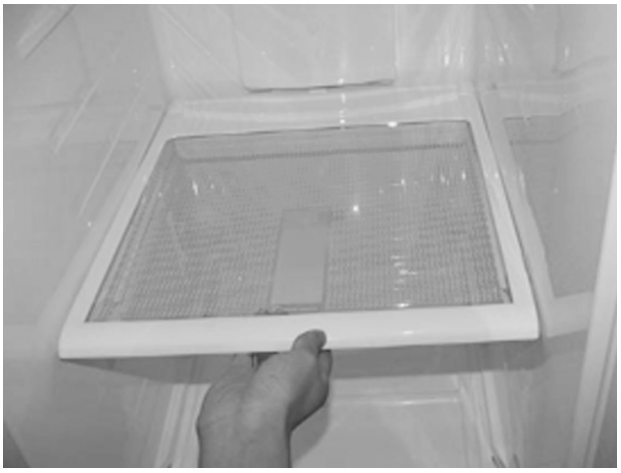


DRAWERS

The drawers are located at bottom side of freezer and refrigerator.
1) Pull the drawer out as far as it goes.
2) Lift it up slightly and pull it out from the unit.

SHELF LOW REF. IN REFIGERATOR

The shelf low ref. in refrigerator can be removed as following sequence.
1) First, remove the drawer upp..
2) Pull the shelf out as far as it goes.
3) Lift it up and pull it out from the unit.



TRAY-REF

The tray-ref is located at bottom of shelf-ref in refrigerator compartment.
1) Pull the tray-ref out as far as it goes.
2) Lift it up slightly and pull it out from the shelf.

FOOD GUARDS

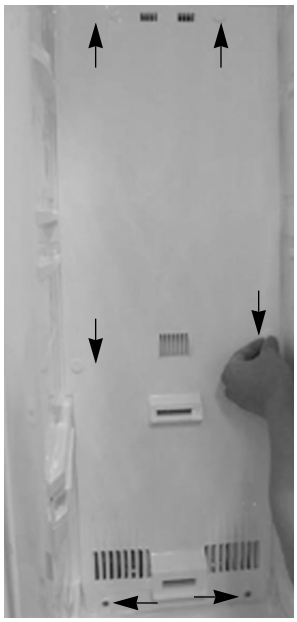
1) Lift the guard up and pull it out from door liner.

8-2. Cooling Unit

COVER EVAP FRONT IN FREEZER

Before disassemble the cover, Should be removed all accessories in freezer.

1) Pull the screw cap out (4 EA).
2) Remove the screws (6 EA).
3) Grasp the bottom edge of the cover, and pull it out from the unit.



COVER DUCT REAR IN FREEZER

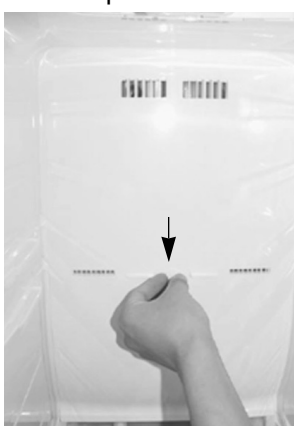
Before disassemble the cover, Should be removed cover duct. front.

1) Remove the screws (3 EA).
2) Grasp the bottom edge of the cover, and pull it out from the unit.
3) Disconnect the wire connector and pull the cover out from the unt.

COVER DUCT FRONT IN FREEZER

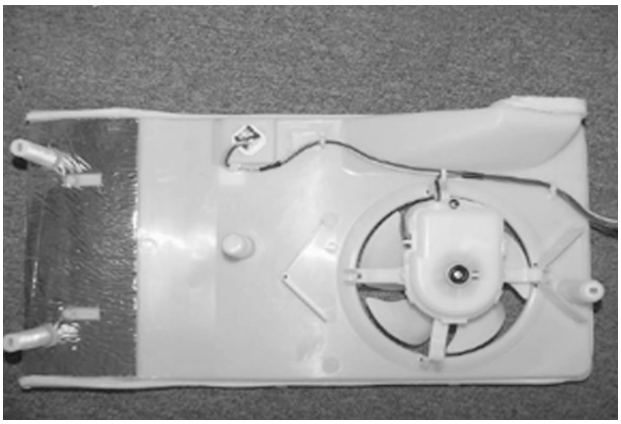
Before disassemble the cover, should be cover evap. front.

1) Pull the screw cap out (1 EA).
2) Remove the screws (1 EA).
3) Grasp the bottom edge of the cover, and pull it out from the unit.
4) Disconnect the sensor wire connector and pull the cover out from the unt.



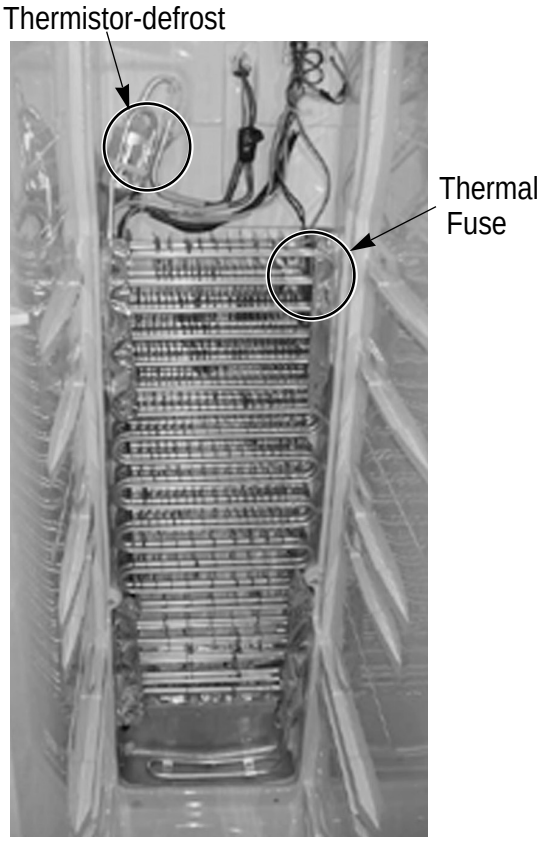
FAN MOTOR

1) Remove the fan propeller (1 EA).
2) Disconnect the wire connector from body of the cover.
3) Remove the screws (3 EA) and separate the fan motor case.
4) Open the case and remove fan motor.



EVAPORATOR IN FREEZER

1) Take off cover evap front, cover duct front and cover duct rear in sequence.
2) Disconnect all wire connectors.
3) Desolder the inlet and outlet tube.
4) Remove the evaporator.



THERMAL FUSE

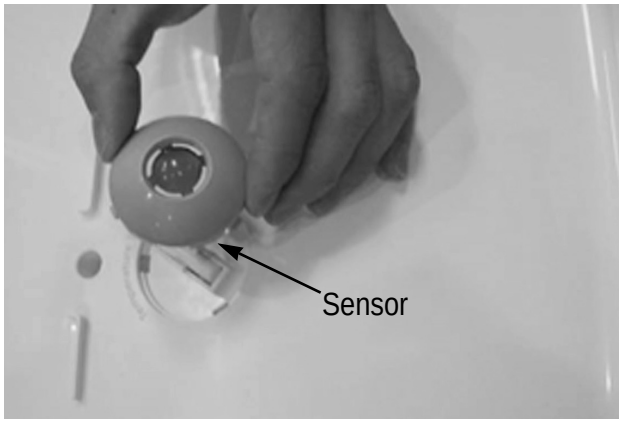
Thermal fuse is located at top of the evaporator.
1) Disconnect the wire connector of thermal fuse.
2) Cut the cable tie for securing the fuse.
3) Separate the fuse from the evaporator.
   ※ Do not desolder evaporator to replace the fuse only.

THERMISTOR DEFROST

Thermal fuse is located on accumulator of evaporator.
1) Disconnect the wire connector of thermistor-defrost.
2) Cut the cable tie for securing the thermistor.
3) Separate the thermistor from the evaporator.
   ※ Do not desolder evaporator to replace the thermistor only.

THERMISTOR IN FREEZER

Before disassemble the thermistor, Should be removed cover duct. front.
1) Remove the sensor cover.
2) Separate thermistor.

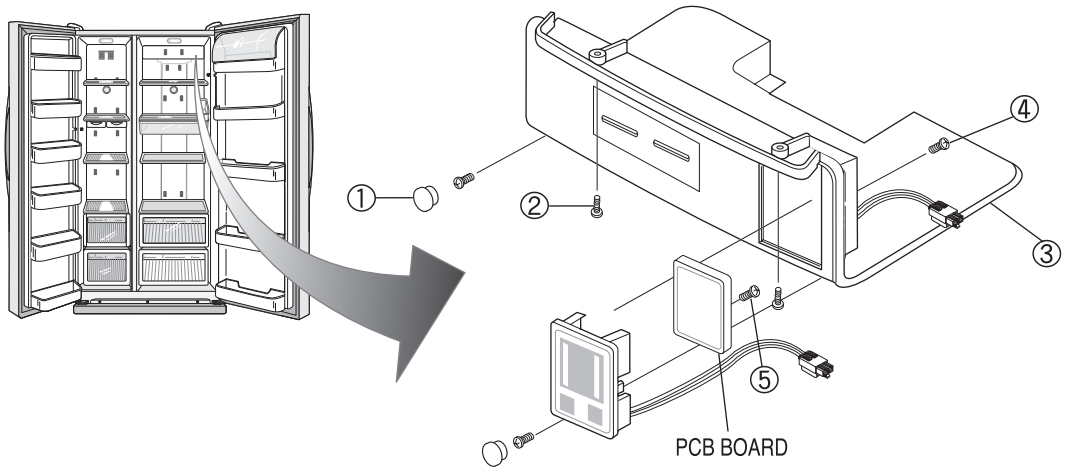


AMBIENT THERMISTOR

The thermistor is located at inside the upper hinge cover. It sends temperature signal to the micro-processor.

ASS'Y DAMPER

The Damper is for controlling cold air circulation.



- After disassemble cap screw(①) disassemble the screw(②).
- Disassemble the connectors then, pull out the damper cover(③) from refrigerator.
- After disassembling the screw(④) from the damper cover(③), disassemble the temperature control part by pulling forward from the damper cover(③).
- Disassemble the screw(⑤) from the assembly part of temperature control part. And disassemble the PBA board.
- Assembly is reverse of disassembly.

COVER MULTI IN REFRIGERATOR

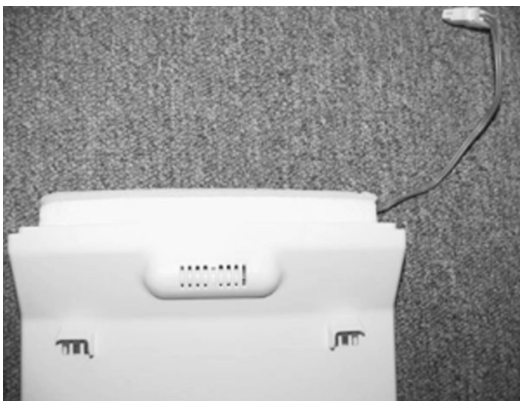
Before disassemble the cover, Should be removed Ass'y damper.

1) Pull the screw cap out (1 EA).
2) Remove the screws (1 EA).
3) Disconnect the wire connector of thermistor.
4) Grasp the bottom edge of the cover, pull it down and remove it.

THERMISTOR IN REFIGERATOR

Before disassemble the thermistor, Should be removed cover multi.

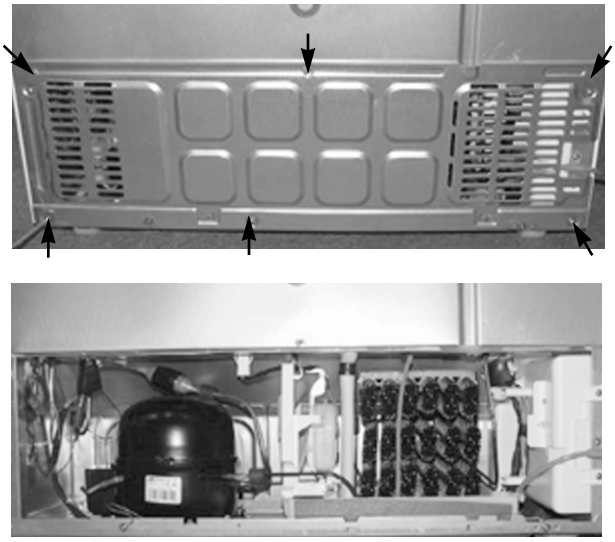
1) Peel off the tape on the back side cover assembly.
2) Separate insulation of cover multi from the cover.
3) Remove the sensor.



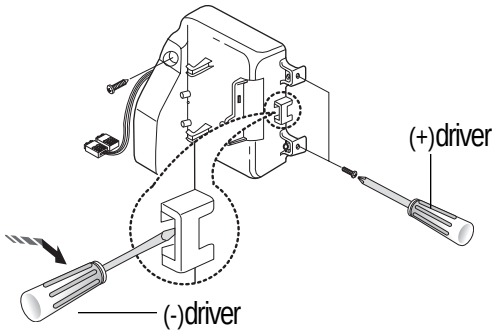
8-3. Machine compartment

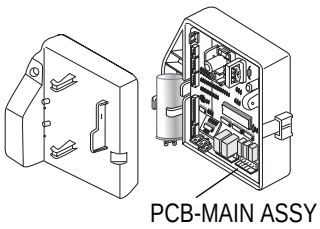
Machine Compartment & Electric Box

1) Disconnect the compressor cover by releasing the screws(6EA).



2) Remove the screws which are securing the electric box. and press the tap in electric box coverto take outbyusing a flat-blade screw driver.





Condenser Fan

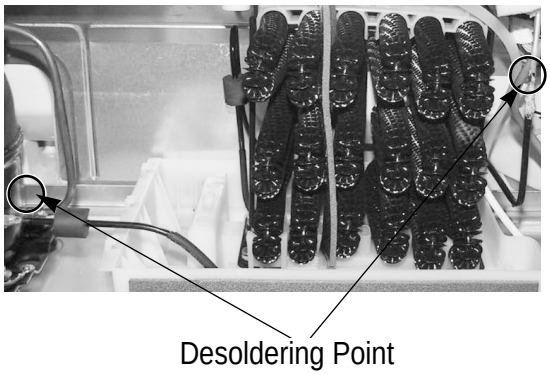
The condenser fan is located in the middle of machine compartment it cools down the sub-condenser and compressor.

1) Disconnect the wire connector of Fan.
2) Remove the screws (1 EA) on the drain water tray.
3)Take out the condenser fan assembly.

Sub-condenser

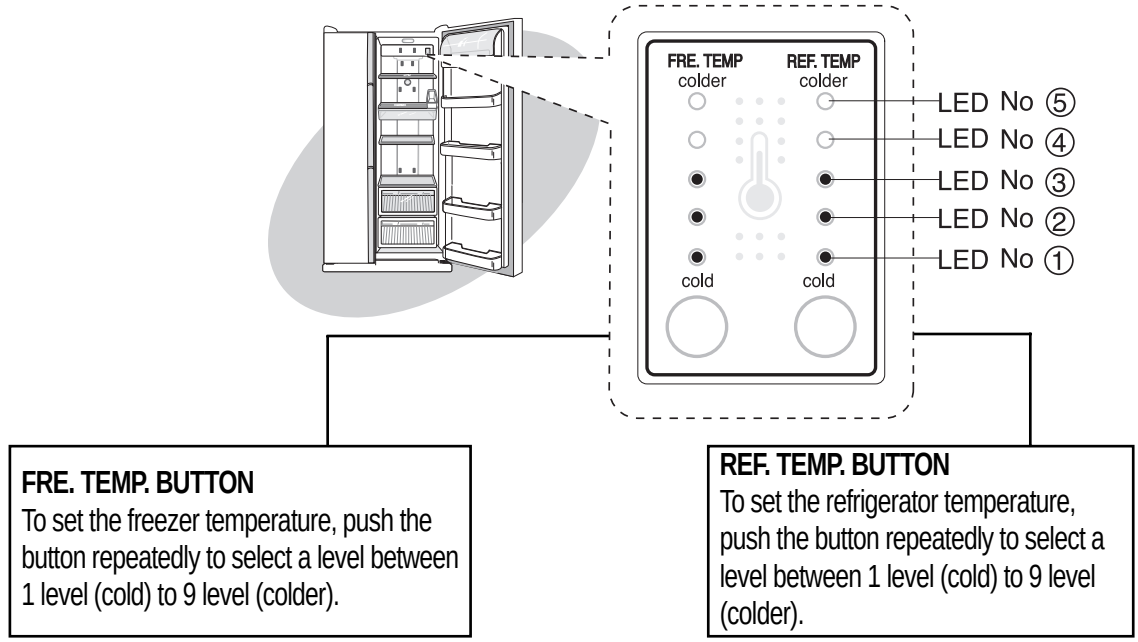
The sub-condenser is located in the machine compartment.

1) Desolder the compressor discharge & the outlet of sub-condensor.
2) Take out the sub condenser.



9. FUNCTION AND OPERATION

9-1. Panel Display



FRE. TEMP. BUTTON
To set the freezer temperature, push the button repeatedly to select a level between 1 level (cold) to 9 level (colder).

REF. TEMP. BUTTON
To set the refrigerator temperature, push the button repeatedly to select a level between 1 level (cold) to 9 level (colder).

NOTE
• The higher level you set, the lower temperature inside the unit.

9-2. Temperature Control

1) Freezer

- The freezer temperature can be set to a level between 1 level (cold) to 9 level (colder).
- Push the **FRE. TEMP.** button repeatedly until the desired level is reached.
- At each level, the LED lamps will turn on or off as shown on the table.

2) Refrigerator

- The refrigerator temperature can be set to a level between 1 level (cold) to 9 level (colder).
- Push the **REF. TEMP.** button repeatedly until the desired level is reached.
- At each level, the LED lamps will turn on or off as shown on the table.

Control table

Temp. (about)	Fre	-16℃	-18℃	-20℃	-22℃	-25℃
	Ref	6℃	4℃	3℃	2℃	1℃
Reference		cold →		normal →		colder

LED condition									
	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	●
	④	④	④	④	④	④	●	◐	●
● (on)	③	③	③	③	●	◐	●	●	●
○ (off)	②	②	●	◐	●	●	●	●	●
◐ (blink)	●	◐	●	●	●	●	●	●	●
level	1	2	3	4	5	6	7	8	9

※After blinking (◐) for 3second, led turn on (●).

NOTE
• For your convenience, your freezer/refrigerator controls have been preset at the factory. The freezer/refrigerator control should both be set to normal (level 5) when you first install your freezer/refrigdfator.

9-3. Alarm

1) Button touch sound ("DING-DONG")

① If the panel button is pressed, "DING-DONG" sound of input confirm is occurred.
② If the buttons are pressed at the same time or incorrectly, this sound is not occurred.

2) Alarm sound at the door opened ("beep")

① If the door of refrigerator/freezer is opened and has passed 2 minutes, the alarm is occurred in 10 seconds.
② If the door is remained in open continuously, the alarm continues for 10 seconds 1 minute periodic.
③ The alarm is sopped at once after closing the door of refrigerator/freezer.

3) Alarm sound at the forced start , defrost ("beep")

① If the forced start or defrost is selected , ("beep") alarm sound occurred.
② If the forced start is selected, the alarm is continued to the auto release(after 24 hours operation in forced start) or the selection of release function.
③ Also at the forced defrost, the alarm is continued to the completion(including the pause times) or the selection of release function.

9-4. Defrost

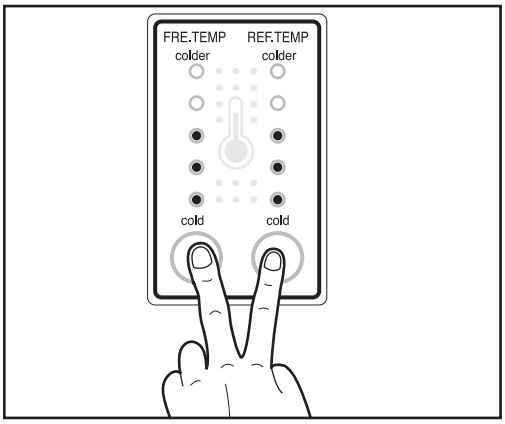
1) The freezer defrost is decided according to the integration time of Compressor ON.
2) At the initial power ON, freezer defrost is performed after 4 hours of integration time of Comp. ON.
3) After this, a defrost period is variable from 6 hours to 11 hours in accordance with the use condition and ambient environment.
4) The defrost period is decided by the outdoor temperature, number and time of the opening of refrigerator door.

9-5. Test function

1) Selection of test function

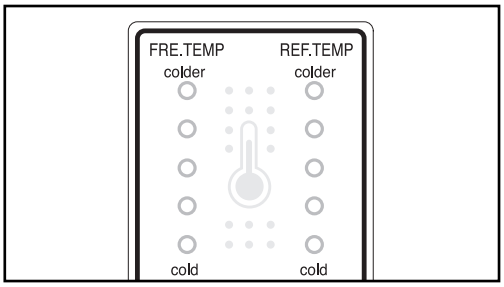
Following two procedures are sequences for changing normal mode into test mode.

① Press both 'R room key' and 'F room key', and keeping pressing keys over 11 seconds.
Note) 0∼3 seconds : no phenomenon
3∼7 seconds : panel display blinks of 0.5 sec interval
7∼11 seconds : panel display blinks of 0.2 sec interval
② Press F room key after releasing two keys when 11 seconds passed. Then the mode is changed to the test mode.
③ In the test mode, F room key is main key for changing status.
Note) One times : forced running
Two times : forced defrost (1)
Three times : forced defrost (2)
Four times : release function

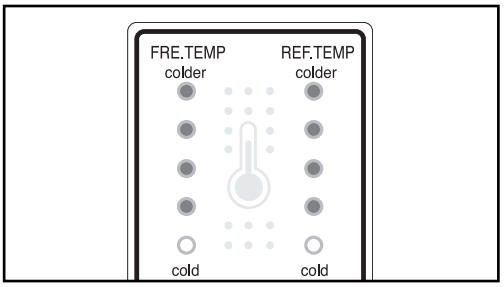


2) The change of lamp displays test mode function(Pressing for 7 seconds)

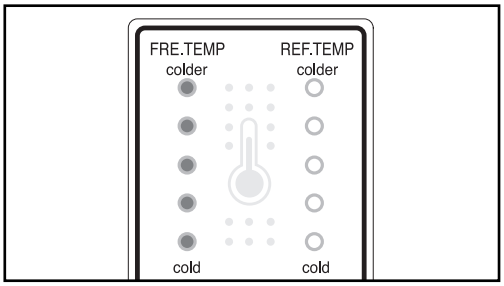
① At the time of test mode selection : Lamp all OFF



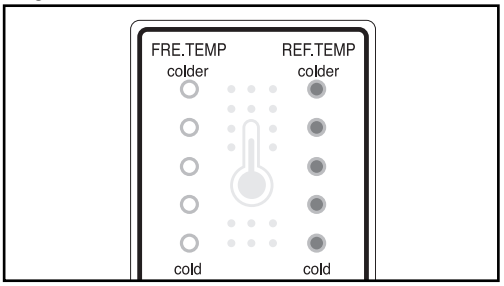
② At the time of forced running selection : 8 lamps ON



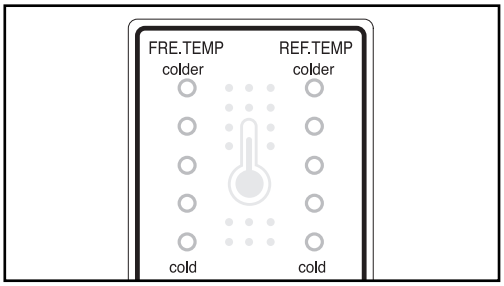
③ At the time of forced defrost(1) selection : 5 lamps of freezer control ON



④ At the time of forced defrost(2) selection : 5 lamps of refrigerator control ON



⑤ At the release of test function : Lamp all OFF



3) Forced running

① At the test mode, once more pressing the F room key selects forced running. At this time, buzzer performs alarm by beep.

② If the forced running is selected, compressor is in action immediately without 5 minutes delay action. If defrost is proceeded at this time, defrost stops immediately.

③ If the forced running is selected, compressor and F-fan is operated on pull down for 24 hours, and R room is controlled by set temperature.

④ The forced running is performed continuously until the completion(24 hours) or change to another mode, or release..

⑤ If the forced running is selected, freezer is selected to " colder(-25℃)" , and refrigerator " middle colder(2℃)"

⑥ After the forced running is completed(24 hours), defrost is performed regardless of the former mode.

⑦ If the forced running is released, Comp. on time during the forced running is reflected in a defrost period by addition.

4) Forced defrost

① When the test mode is selected, if F room key is pressed in twice, the forced defrost(1) is selected.
② If F room key is pressed in three times, the forced defrost(2) is selected. But the forced defrost(2) mode is not used.
③ The beep sound continues, during the heating and resting period.
④ Damper (cooling air interception) closes until the completion of defrost time.

9-6. Self Diagnosis

1) Self diagnosis in the initial power on

① When a power is ON, if internal MICOM will decide faulty in temperature within 1 second.
② If faulty sensor is found, the “related display LED” switches ON and OFF for 0.5 second intervals.
③ At the LED situation is the faulty sensor display, self-test function key (F room key + R room key for 11seconds) is the control of normal temperature is delayed.
④ Fixing default sensor when there is an error, or press F room key and R room key for 11 seconds, it automatically cancel self-test function and activate normally.

2) Self diagnostics in the normal operation

① If “ F-ROOM +R-ROOM” key is pressed for 3 seconds at the normal operation, temperature setting display proceeds ALL ON/OFF by 0.5 second intervals foe about 4 seconds. If “ F-ROOM +R-ROOM” key is pressed for 7 seconds including 4 seconds of ON/OFF, all displays proceed ALL ON/OFF by 0.2 second intervals for about 4 seconds. If “ F-ROOM +R-ROOM” key is pressed for total 11 seconds including 4 seconds of 0.2 second intervals ON/OFF, all displays becomes ALL ON and “ “ buzzer occurred, and then start a self diagnosis.
② Self diagnosis is performed from “ colder-colder” LED with being OFF in sequence at the state that freezer /refrigerator temperature setting displays are all ON.
③ In case of detection inferior sensor, the corresponding display lamp keeps up ON.

(Self diagnosis display table)

No	Items	Symptorn	Troubles Remarks	LED(cf. page23)
1	R-Sensor	Detaching the sensor Housing, fault of Connection, open or short of power cable, sensoritse lfinferiority, the others...	Displayed inferiority When temperature detection of sensor is over 65 ˚C or below -50˚C.	R “Cold.Mid” R room LED No ②
2	Outer Sensor	Detaching the sensor Housing, fault of Connection, open or short of power cable, sensoritse lfinferiority, the others...	Displayed inferiority When temperature detection of sensor is over 65 ˚C or below -50˚C.	F “Cold” F room LED No ①
3	F-Sensor	Detaching the sensor Housing, fault of Connection, open or short of power cable, sensoritse lfinferiority, the others...	Displayed inferiority When temperature detection of sensor is over 65 ˚C or below -50˚C.	F “Cold.Mid” F room LED No ②
4	F-room defroster Sensor	Detaching the sensor Housing, fault of Connection, open or short of power cable, sensoritse lfinferiority, the others...	Displayed inferiority When temperature detection of sensor is over 65 ˚C or below -50˚C.	F “Mid” F room LED No ③
5	F Fan error (only stopping)	Detaching of fan housing, fault of Connection, open or short of power cable,fan itself inferiority, constraint by fan wings freezing...	In case that BLDC fan motor feed back signal is not detected ordetected the abnormal signal.	F “Mid. Colder” F room LED No ④
6	C Fan error (only stopping)	Detaching of fan housing, fault of Connection, open or short of power cable, fan itself inferiority, constraint by fan wings freezing...	In case that BLDC fan motor feed back signal is not detected ordetected the abnormal signal.	F “Colder” F room LED No ⑤

※ If you try to check the fan error condition, you should check the error at the forced running condition.

9-7. Display function of the presently operating parts

1) If you press 'F room key' and 'R room key' button together for 3 seconds during normal operation, LED display will show ON/OFF for 4 seconds at interval of 0.5 second.
2) At this moment, if you take off 'F room key' and 'R room key' button and press 'R room key' button, it change into the display of the presently operating parts.
3) This display condition is unrelated to actual operation and it is an reference of indication that MICOM commanded operating order.
4) After 30 seconds illumination of error signal, the system will return to the normal operation.

(Display table of the presently operating parts)

NO	CONTENT	DISPLAY LED	
1	DAMPER	R " Cold "	R room LED No ①
2	At the normal times	R " Cold. Middle "	R room LED No ②
3	In the conditions of overload (over 30℃)	R " Middle "	R room LED No ③
4	C-FAN HIGH	R " Middle. Colder "	R room LED No ④
5	C-FAN LOW	R " Colder "	R room LED No ⑤
6	COMP	F " Cold "	F room LED No ①
7	F-FAN HIGH	F " Cold. Middle"	F room LED No ②
8	F room defrost heater	F " Middle"	F room LED No ③
9	F-FAN LOW	F " Middle. Colder "	F room LED No ④
10	In the conditions of low temperature	F " Colder "	F room LED No ⑤

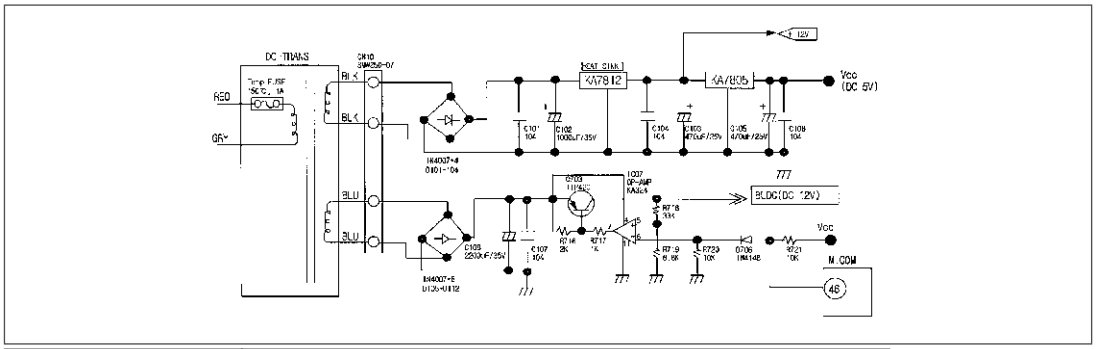
9-8. C-FAN(Comp-fan) Control In Accordance With Outdoor Temperature

1) According to the ambient temperature, the condenser fan located in the machine compartment is operated with different modes.

	Ranges of ambient temp.	Operation
C-FAN Delay function	Above 18 ℃	C-FAN is ON as soon as the compressor ON.
	13～17 ℃	C-FAN is ON with 5 minutes delay from the compressor ON.
	Below 12 ℃	C-FAN is OFF regardless of the compressor operation.

10. CIRCUIT DESCRIPTION

10-1. Power source part

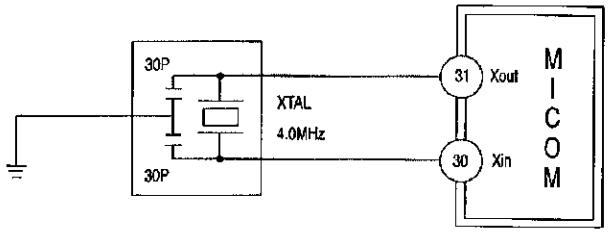


Power source	Used circuit
Vcc(DC 5V)	Surrounding power of MICOM and sensor detection part
+2V(DC 12V)	Relay driving part, panel display part
BLDC(DC 12V)	OP AMP, TR constant voltage circuit use(BLDC fan motor drive)

AC 220V input power is reduced by passing through LVT(DC-TRANS), this power is changed to DC voltage through rectification diode. After this, DC 12V leveled by 1000uF/35V capacitor and settled by regulator 7812 is output and in use for relay and panel PCB driving power, input power and refrigerator control.

Another the second of LVT(DC-trans) is leveled by rectification diode and 1000uF/35V capacitor, and controlled to set voltage by OP amp, constant voltage TR circuit, and then supplies a settled voltage to BLDC motor.

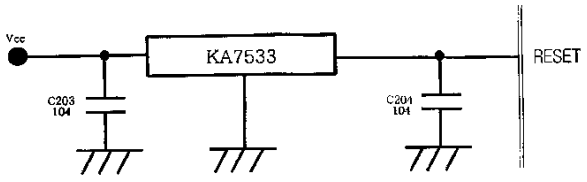
10-2. Oscillation circuit part



Terminal	Oscillation frequency
Xin(#30)	4MHz
Xout(#31)	4MHz

Oscillation circuit is for clock occurrence for synchronism to the information transmission/reception of MICOM internal elements and for time calculation. If the resonator spec is changed, normal function is not performed because of the changing of MICOM timing system.

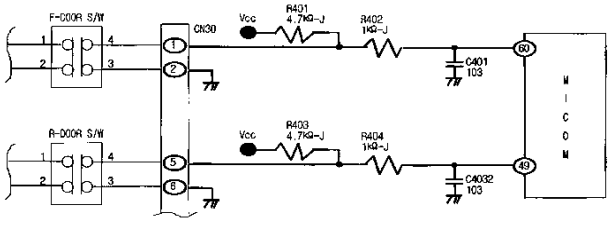
10-3. Reset circuit part



Terminal	Voltage
Vcc	DC 5V
RESET	DC 5V

Reset circuit is that initializes many internal parts of the MICOM and makes the all programs to act in the initial state in case that power is impressed to MICOM by instantaneous interruption or power input. Reset terminal voltage becomes to scores of us " LOW" compared to the MICOM Vcc((DC 5V) voltage on power impression, and keeps " HIGH" (Vcc voltage) on the normal action.

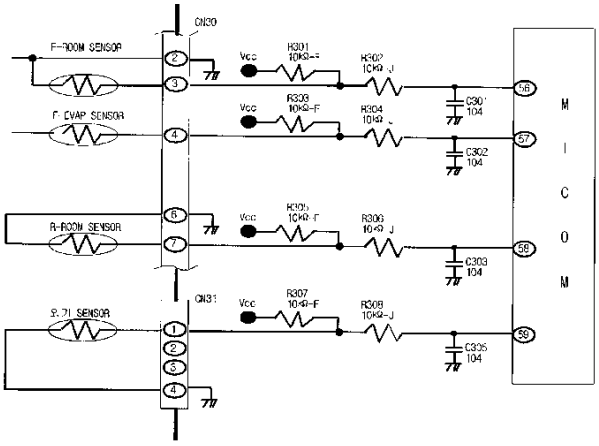
10-4. Door S/W detection circuit



Terminal	Door state	MICOM input
F room	CLOSE	0V (LOW)
	OPEN	5V (HIGH)
R room	CLOSE	0V (LOW)
	OPEN	5V (HIGH)

CN30℃ is connected to GND and ② is supplied Vcc(DC 5V) by passing through Resistance R401 (10℃), and it detects F room door open/close by impressing to MICOM " HIGH(5V)/LOW" . CN30 ℃ is connected to GND and ① is supplied Vcc(DC 5V) by passing through resistance R403(10℃), and it detects R room door open/close by impressing to MICOM " HIGH(5V)/LOW" If there are some faults in door S/W at this time, the corresponding fan is not act or alarm occurs. Check the door S/W whether it has an abnormality. If the door is opened, the internal corresponding fan stops. This is occurred because MICOM stops the fan deciding door open although door is closed when being S/W contact point abnormality.

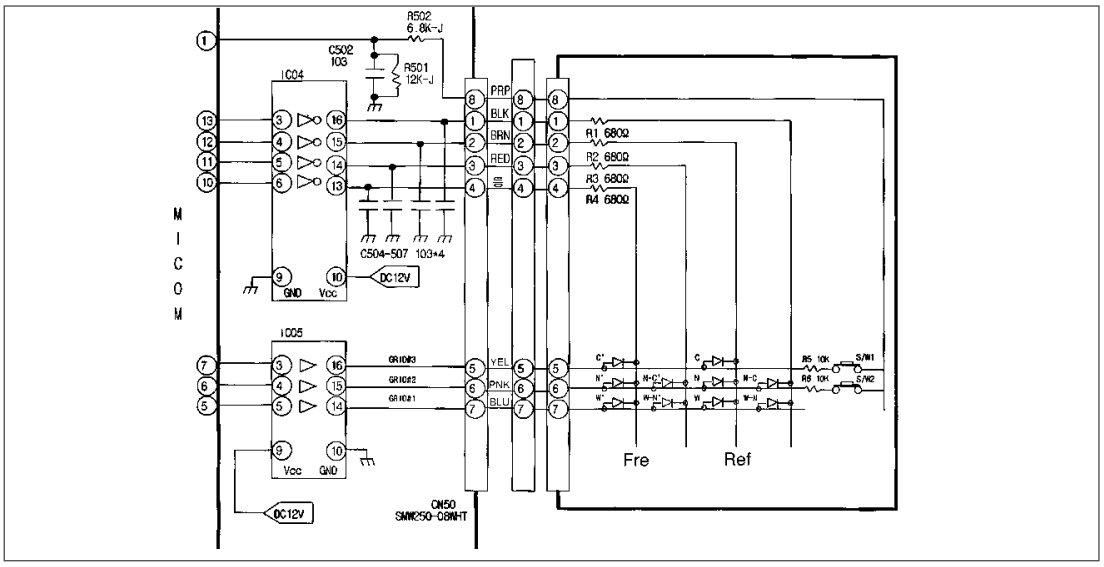
10-5. Temperature detection circuit



MICOM terminal	Voltage
PIN #56 (F-SENSOR)	Outdoor temperature MICOM terminal voltage is changed by the temperature.
PIN #57 (F-DEF-SENSOR)	
PIN #58 (R-SENSOR)	
PIN #59 (ATMOSPHERE SENSOR)	

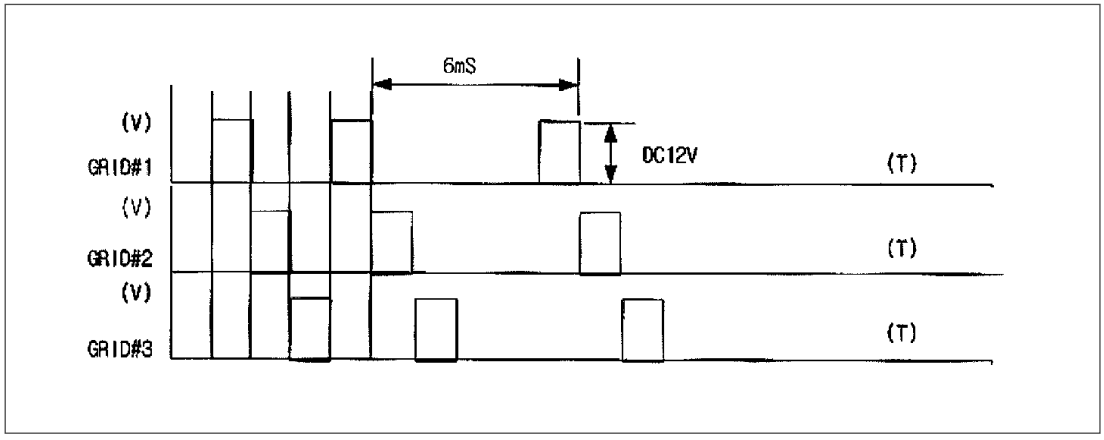
Sensor makes use of the character that resistance value becomes smaller when temperature is high, and bigger temperature is low by use of thermistor having a indeterminate resistance temperature coefficient. R302,4,6,8 and C301,2,3,5 have no concern with temperature detection because they are for noise protection parts. In case of F-sensor, if the voltage that input to MICOM is supposed to Vf, Vf= (Rth x Vcc)/(R301 + Rth).At this, Rth is a thermistor resistance value. Refer to attached appendix for MICOM terminal voltage corresponded to temperature and resistance/voltage conversion table of sensor.

10-6. Key scan and display circuit part



1) Description of key scan and display drive action

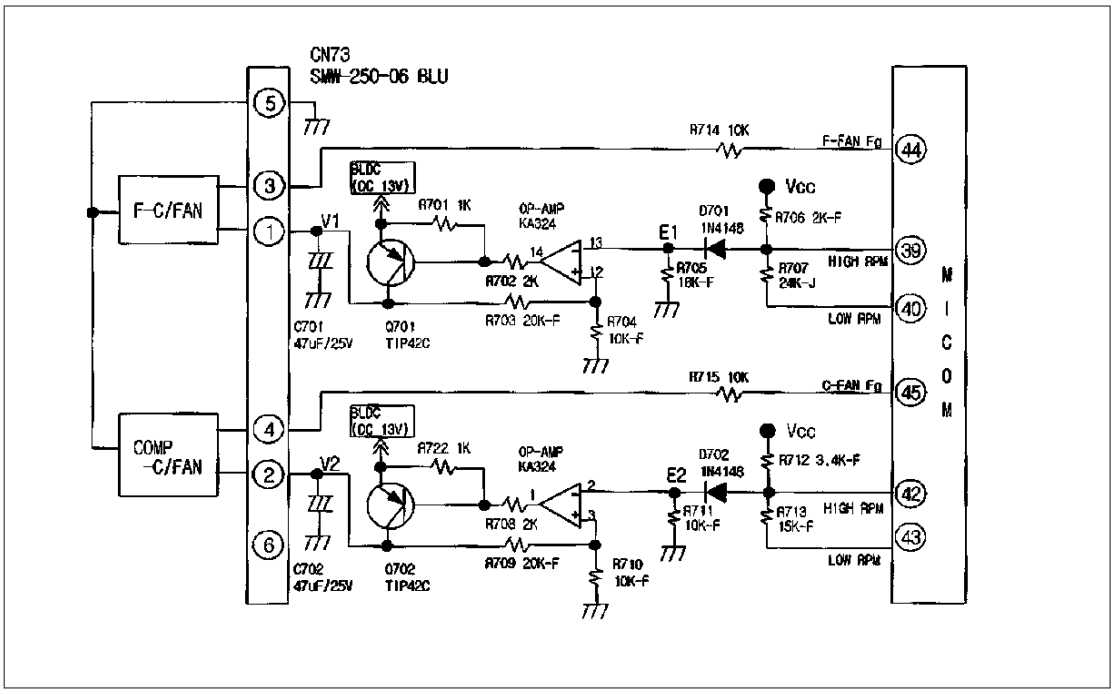
As a following each part wave, " HIGH" output is send out, by use of three terminals of MICOM No #5,6,7 by 6 msec intervals. This signal passes through input terminal of IC05 and is displayed to output terminal. At this time, the peak to peak voltage of rectangle wave is about 12V, the shape of output wave is like following.



2) KEY SCAN

When GRID #3 wave is output, this signal is supplied to SW1 by passing through panel PCB R5 resistance 10℃. At this time, pressing SW1 makes a signal small by R508(6.8㏀) and R505(12㏀), and impress peak to peak 4.5V to MICOM. MICOM decides that GRID #3 wave is input and changes the function corresponding to SW1. Like this, each GRID wave is recognized.

10-7. BLDC MOTOR drive circuit



● Movement description

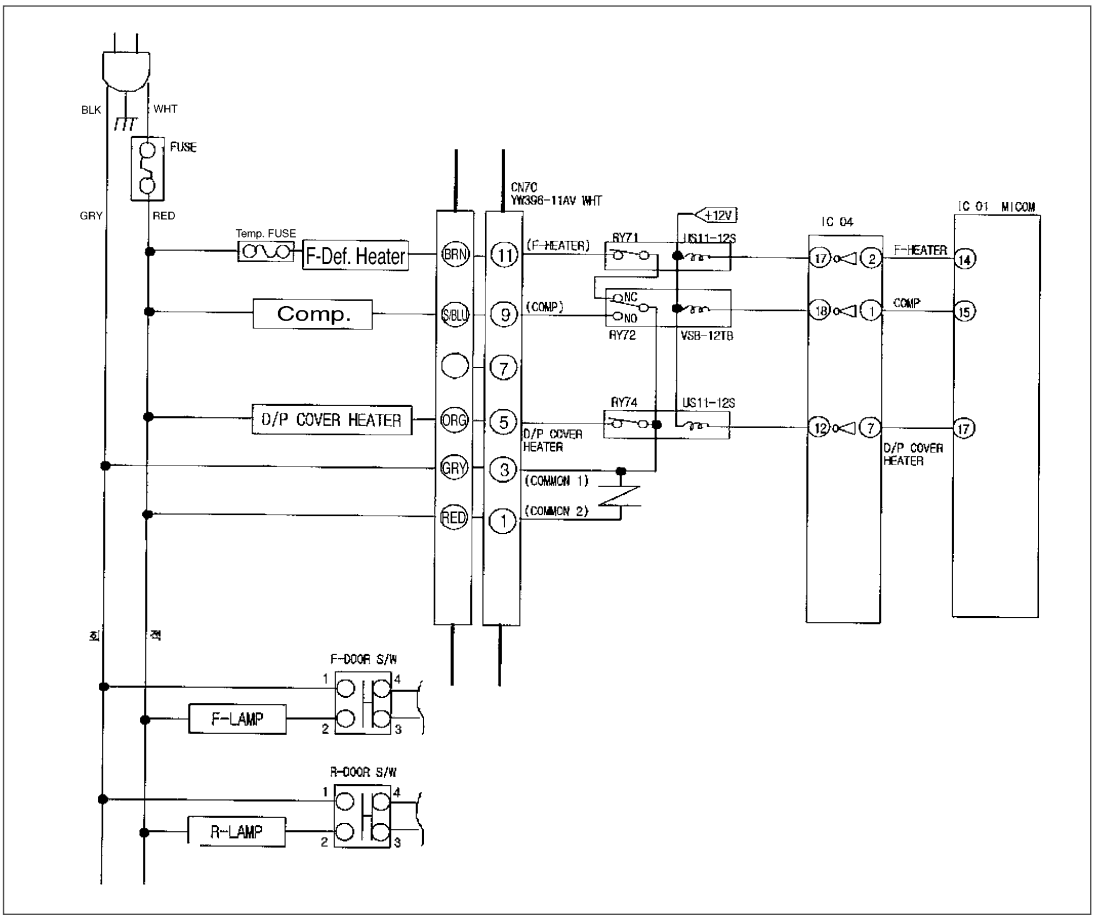
When F-fan is driven to LOW RPM, Resetting the MICOM #40 pin with being set #39 always links the R705 and R707 in a parallel. At this time, the voltage is devided between a parallel resistance value and R706, impressed to OP-AMP. It makes Q1 turn ON, F-fan drive. If F-fan is in condition of OFF, MICOM #39 pin is reset and F-fan is stopped. In case of the Comp.-fan, it is controlled by the same method with F-fan. But its drive voltage is different with that because there is a difference in E1 voltage /E2 voltage due to the difference of RPM.

※ Fan motor protection

When the fan is not run because of F-fan/C-fan freezing or power cord connection part inferiority, fan self-signal is not occurred. So MICOM decides fan abnormality. At this time, perform the fan three seconds ON, seven seconds OFF in five times. If there is no signal during the fan ON/OFF five times, after 10 minutes pausing repeat the three seconds ON, seven seconds OFF in five times.

If the signal is occurred during the three seconds ON, seven seconds OFF, MICOM decides that operation is normal and releases all motor protect functions and performs a normal function.

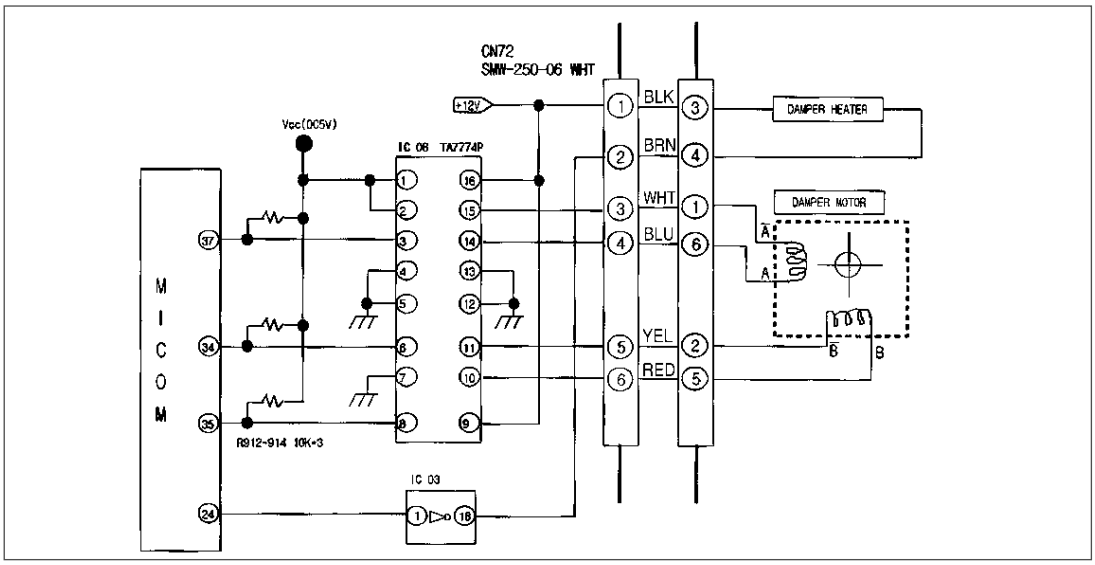
10-8. Load drive part circuit



- Movement description

  When " HIGH" signal is impressed to input terminal of IC04 at MICOM PIN NO #15, IC turns ON. At this time, V12(DC 12V) connected to one side end of Comp relay passes through output of IC04 to ground, and the core of relay causes a magnetic field and makes a contact point on. And AC input voltage(AC 220V) is impressed to the both side end of Comp. load, Comp. acts. In case of the MICOM PIN #15 signal is " LOW" , IC04 turns off and the current is not flow to Comp. relay coil and makes a relay contact off. And Comp. stops. The load except the compressor equals or likes to the act principal of compressor. Refer to the above circuit diagram.

10-9. Damper motor drive part



● Movement description

Damper is a 2 excitation type stepping motor used in controlling the refrigerator temperature. It is opened when the temperature is higher than the setting temperature of refrigerator sensor, and closed lower according to the refrigerator notch.

It performs a open/close without regardless of refrigerator temperature at power ON, and then decides the state of open/close according to the temperature.

Open/close action is controlled by MICOM #34, #35, #37 through damper motor(stepping-motor) exclusive control drive IC(IC8:TA7774P).

Damper heater is supplied DC12V whenever voltage impresses to the refrigerator and the signal is occurred always in MICOM #24, DC 12V flows into
the damper heater by IC3.

※ Note

In case of the above damper heater, because the PCB cannot detect the open/close state, there is no self diagnosis function for deciding the abnormality. IN the above diagram, if a wire cut off linked 3,4,5 of CN7, motor is run as a normal, but refrigerator over cooling occurs by slightly open at the
close of damper.

So, check for deciding of abnormality of damper motor connection part like followings.

1) Check method : After separation of CN72 housing, measure the resistance value by use of multi tester and decide the abnormality.

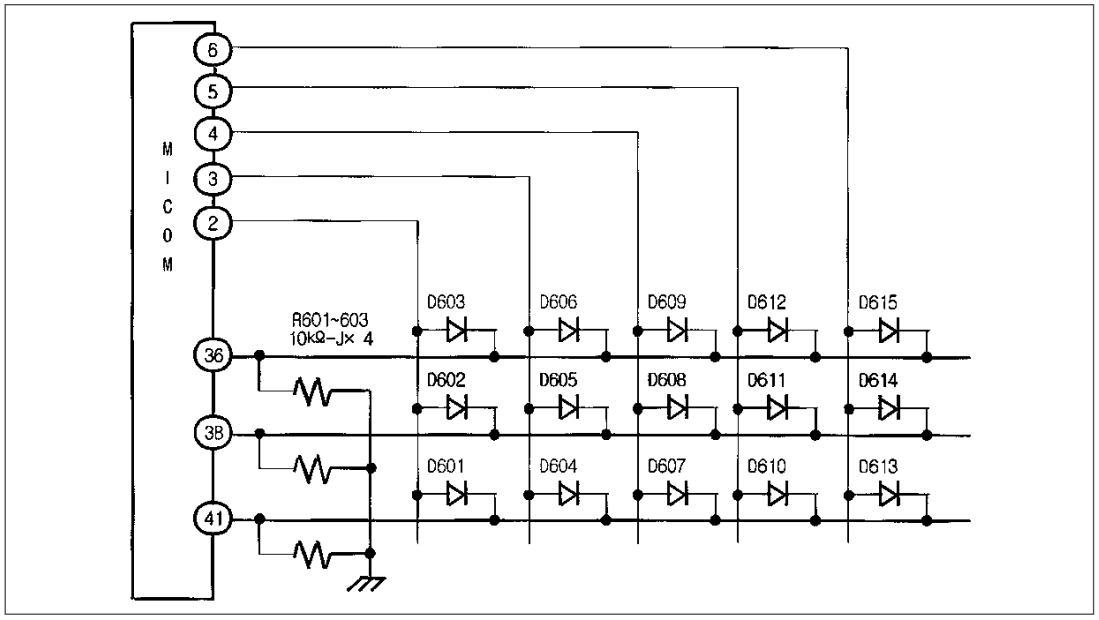
2) Resistance value spec

①-② (black, brown) : 150Ω ±15%

③-④ (white, blue) : 426Ω ±15%

⑤-⑥ (yellow, red) : 426Ω ±15%

10-10. Options



■ As like above circuit diagram, it makes change the items related to temperature and function by use of switching diode on the main PCB.

※ Note
Because the option is set at shipment, hold free change except a special case. After change be sure to

10-11. Temperature related option

■ Freezer temperature shift (unit:℃)

SHIFT	D601	D602	D603
Standard	0	0	0
-0.5	0	0	1
-1.0	0	1	0
-2.0	0	1	1
-3.0	1	0	0
+1.0	1	0	1
+2.0	1	1	0
+3.0	1	1	1

■ Refrigerator temperature shift (unit:℃)

SHIFT	D604	D605	D606
Standard	0	0	0
-0.5	0	0	1
-1.0	0	1	0
-2.0	0	1	1
-3.0	1	0	0
+1.0	1	0	1
+2.0	1	1	0
+3.0	1	1	1

■ Freezer hysteresis (unit:℃)

SHIFT	D608	D609	Basic type
Standard	0	0	±3.0
	0	1	±2.5
	1	0	±3.5
	1	1	±4.0

■ Refrigerator hysteresis (unit:℃)

SHIFT	D607	Basic type
Standard	0	±2.0
	1	±1.0

Appendix

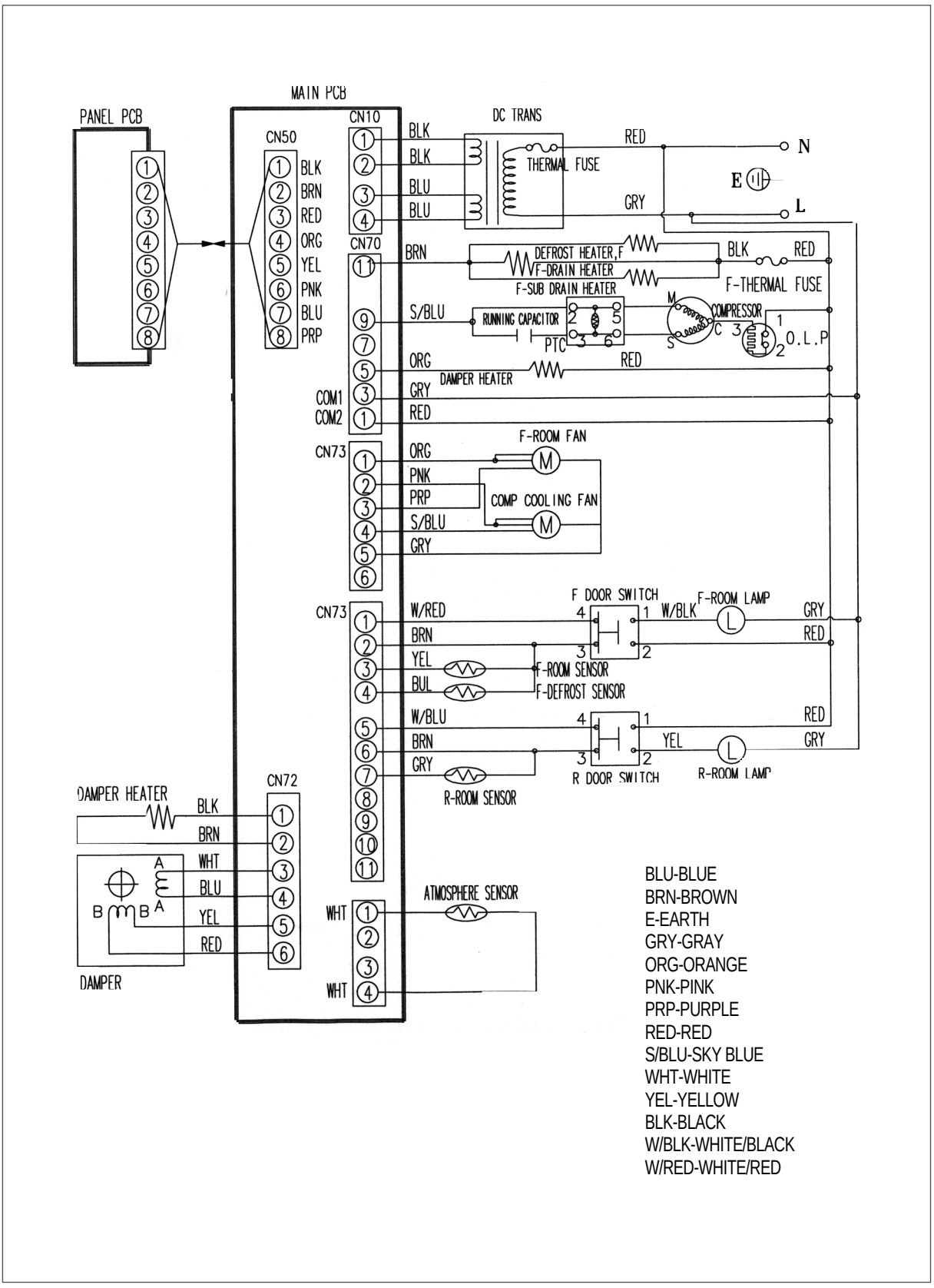
■ Sensor resistance value in accordance with temperature and MICOM b)ort voltage

Temperature(℃)	Resistance(Ω)	Voltage(V)
-42	98870	4.541
-41	93700	4.518
-40	88850	4.494
-39	84150	4.469
-38	79800	4.443
-37	75670	4.416
-36	71800	4.389
-35	68150	4.36
-34	64710	4.331
-33	61480	4.301
-32	58430	4.269
-31	55550	4.237
-30	52840	4.204
-29	50230	4.17
-28	47770	4.134
-27	45450	4.098
-26	43260	4.061
-25	41190	4.023
-24	39240	3.985
-23	37390	3.945
-22	35650	3.905
-21	33990	3.863
-20	32430	3.822
-19	30920	3.778
-18	29500	3.734
-17	28140	3.689
-16	26870	3.644
-15	25650	3.597
-14	24510	3.551
-13	23420	3.504
-12	22390	3.456

Temperature(℃)	Resistance(Ω)	Voltage(V)
-11	21410	3.408
-10	20480	3.36
-9	19580	3.31
-8	18730	3.26
-7	17920	3.209
-6	17160	3.159
-5	16430	3.108
-4	15740	3.057
-3	15080	3.006
-2	14450	2.955
-1	13860	2.904
0	13290	2.853
1	12740	2.801
2	12220	2.75
3	11720	2.698
4	11250	2.647
5	10800	2.596
6	10370	2.545
7	9959	2.495
8	9569	2.445
9	9195	2.395
10	8839	2.346
11	8494	2.296
12	8166	2.248
13	7852	2.199
14	7552	2.151
15	7266	2.104
16	6992	2.057
17	6731	2.012
18	6481	1.966
19	6242	1.922

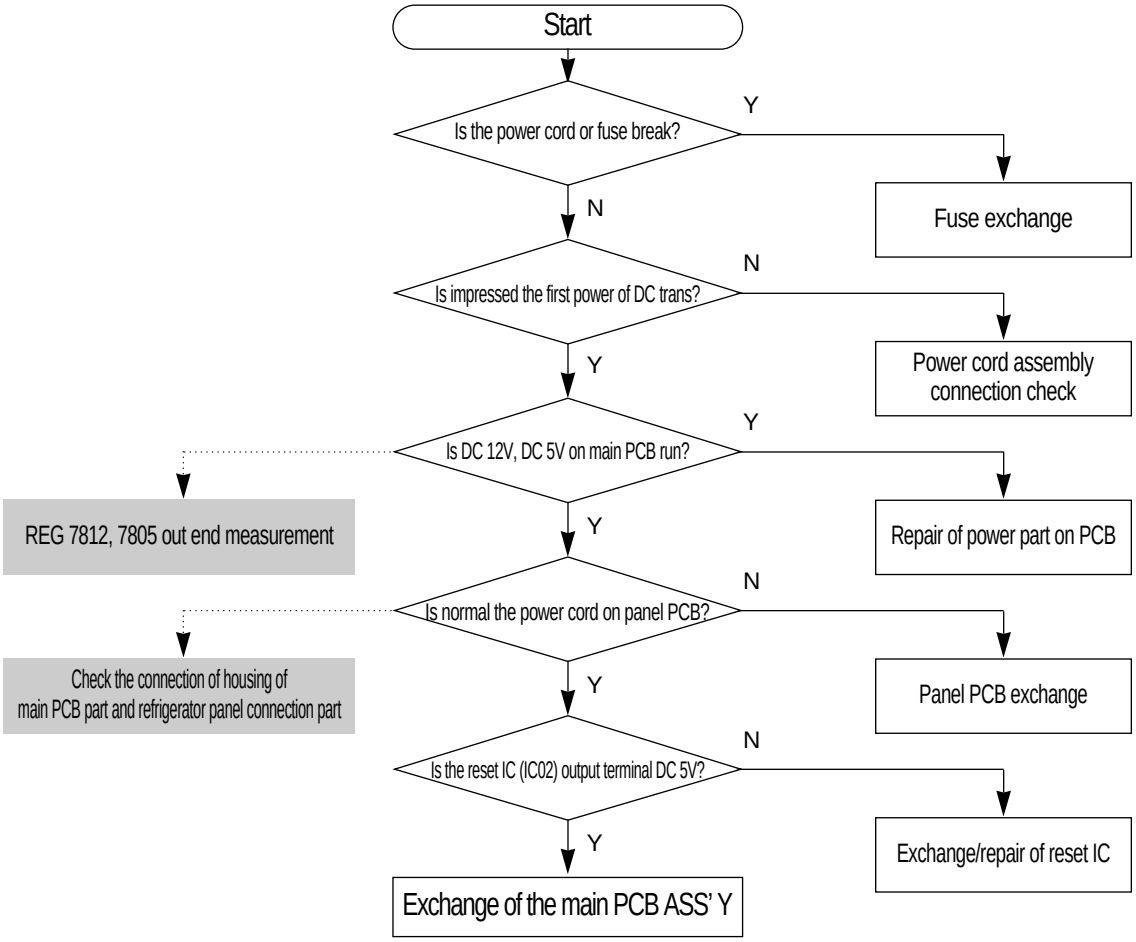
Temperature(℃)	Resistance(Ω)	Voltage(V)
20	6013	1.878
21	5792	1.834
22	5581	1.791
23	5379	1.749
24	5185	1.707
25	5000	1.667
26	4821	1.626
27	4650	1.587
28	4487	1.549
29	4329	1.511
30	4179	1.474
31	4033	1.437
32	3894	1.401
33	3760	1.366
34	3631	1.332
35	3508	1.298
36	3390	1.266
37	3276	1.234
38	3167	1.203
39	3062	1.172
40	2962	1.143
41	2864	1.113
42	2770	1.085
43	2680	1.057
44	2593	1.03
45	2510	1.003
46	2429	0.977
47	2352	0.952
48	2278	0.928
49	2206	0.904

10-12. Electric Circuit Diagram



11. DIAGNOSIS AND TROUBLESHOOTING

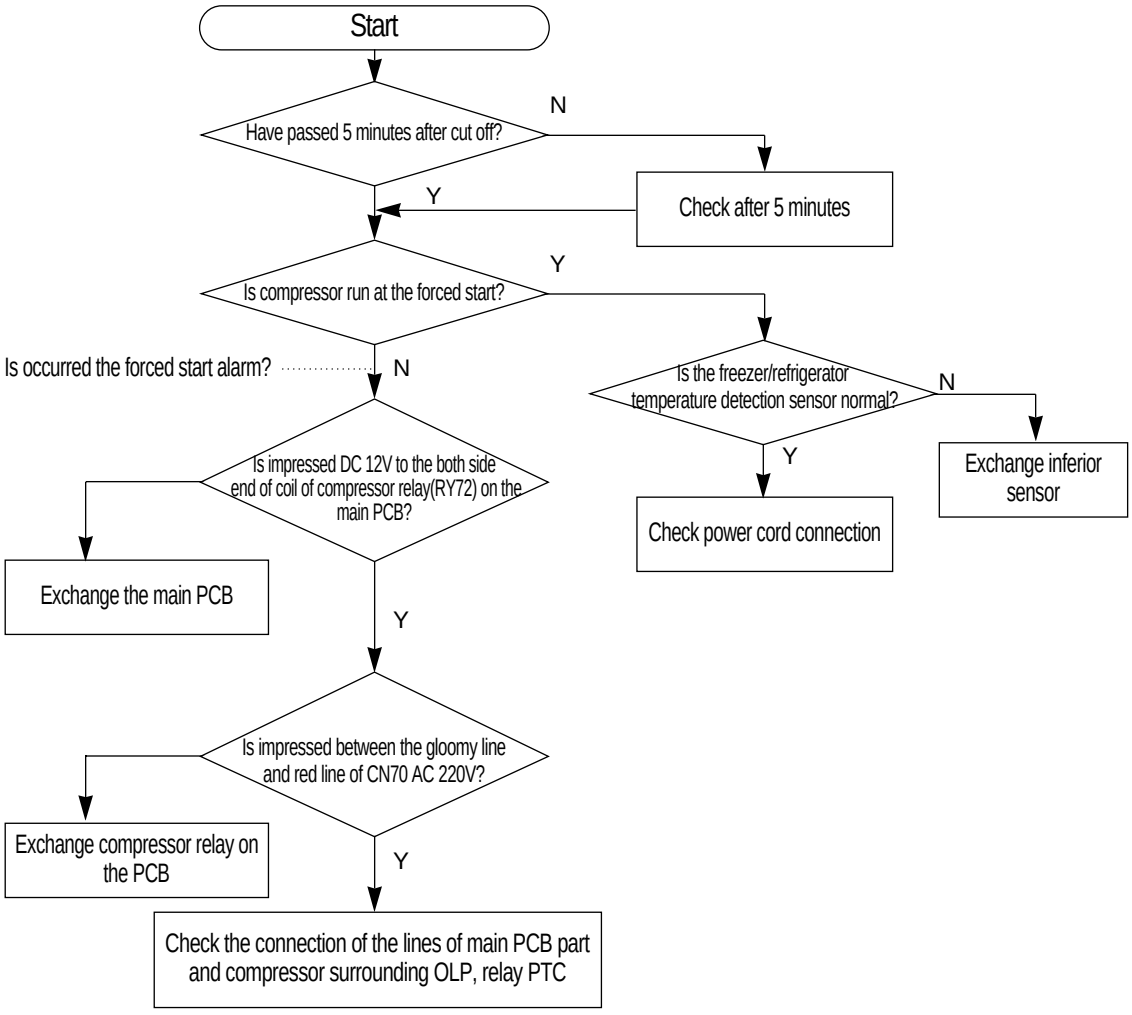
11-1. Power cut off


Start
Is the power cord or fuse break?
Y
Fuse exchange
N
Is impressed the first power of DC trans?
N
Power cord assembly connection check
Y
Is DC 12V, DC 5V on main PCB run?
Y
REG 7812, 7805 out end measurement
Y
Repair of power part on PCB
Is normal the power cord on panel PCB?
N
Check the connection of housing of main PCB part and refrigerator panel connection part
Y
Panel PCB exchange
Is the reset IC (IC02) output terminal DC 5V?
N
Y
Exchange/repair of reset IC
Exchange of the main PCB ASS' Y

11-2. Compressor trouble

Pre-inspection

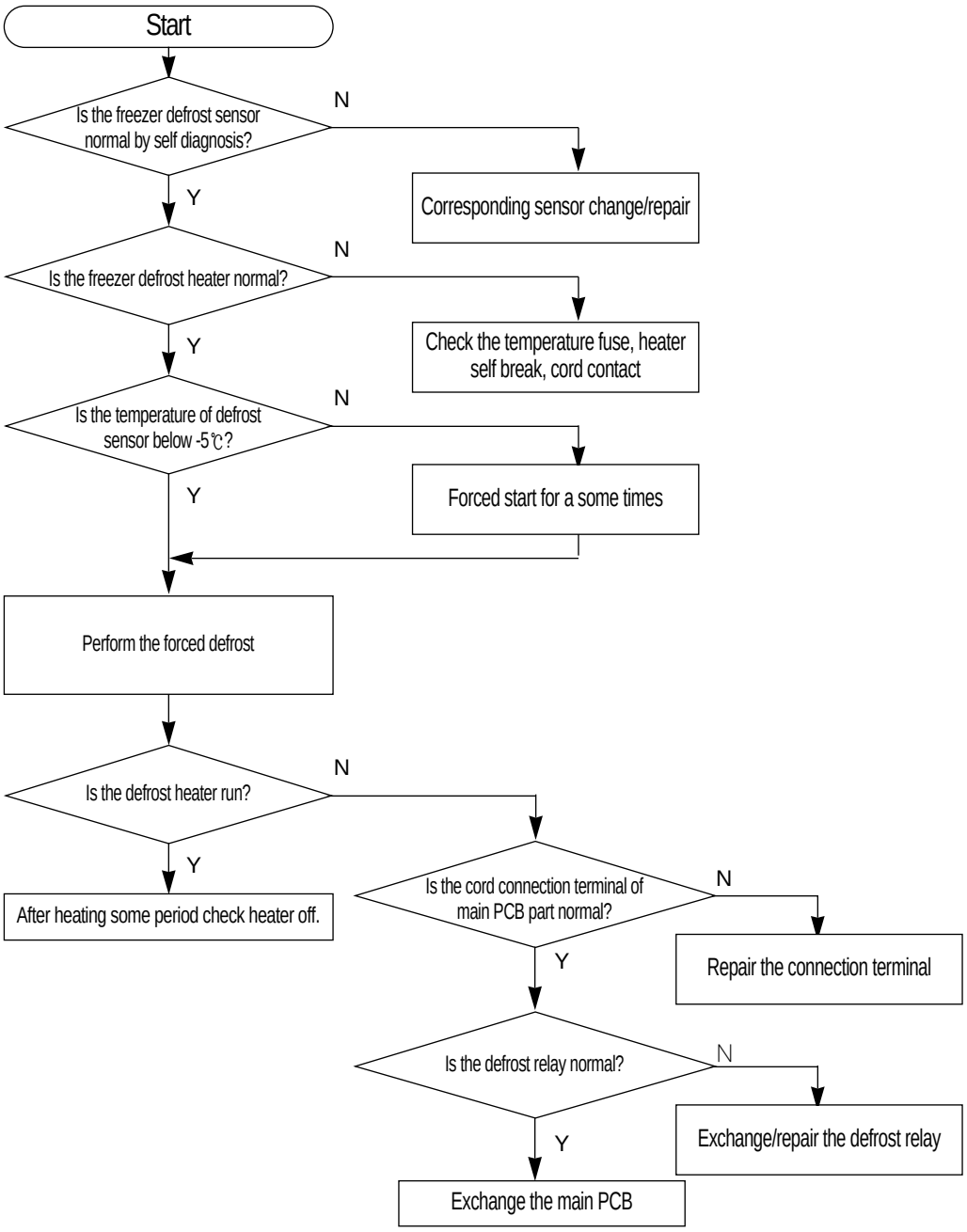
1. If compressor is off by refrigerator temperature, it is not run within five minutes minimum.
2. Compressor is not run during the defrost.
3. If the freezer sensor is not connected, compressor is not run due to low temperature detection.


Start
Have passed 5 minutes after cut off?
N
Check after 5 minutes
Y
Is compressor run at the forced start?
Y
Is occurred the forced start alarm?
N
Is the freezer/refrigerator temperature detection sensor normal?
N
Exchange inferior sensor
Y
Check power cord connection
Is impressed DC 12V to the both side end of coil of compressor relay(RY72) on the main PCB?
Exchange the main PCB
Y
Is impressed between the gloomy line and red line of CN70 AC 220V?
Exchange compressor relay on the PCB
Y
Check the connection of the lines of main PCB part and compressor surrounding OLP, relay PTC

11-3. Defrost failure

Condition for decision

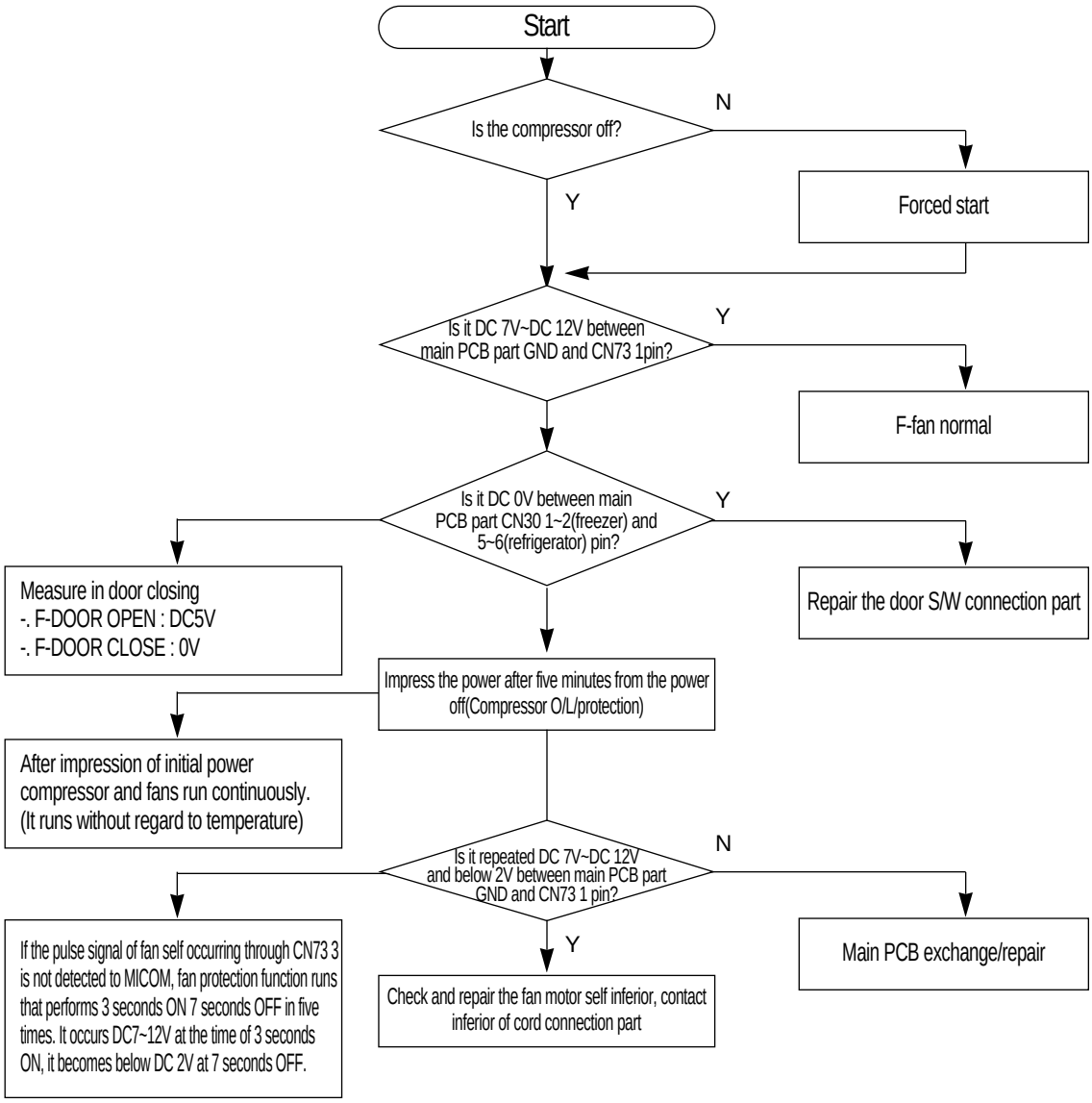
1. In case of the defrost inferior, it runs normally at the initial power on. But the freezing and cooling inferior occurs after some times and at the time of defrost. This is a abnormality of defrost system. Refer to the followings.



11-4. Freezer fan abnormality(BLDC-FAN repair)

Condition for decision

1) When the freezer fan is abnormal, freezer and refrigerator weak cooling occurs.
   This is a freezer fan system failure. Refer to the followings.


Start
Is the compressor off?
N
Forced start
Y
Is it DC 7V~DC 12V between main PCB part GND and CN73 1pin?
Y
F-fan normal
Is it DC 0V between main PCB part CN30 1~2(freezer) and 5~6(refrigerator) pin?
Y
Repair the door S/W connection part
Measure in door closing
-. F-DOOR OPEN : DC5V
-. F-DOOR CLOSE : 0V
Impress the power after five minutes from the power off(Compressor O/L/protection)
After impression of initial power compressor and fans run continuously. (It runs without regard to temperature)
Is it repeated DC 7V~DC 12V and below 2V between main PCB part GND and CN73 1 pin?
N
Main PCB exchange/repair
Y
If the pulse signal of fan self occurring through CN73 3 is not detected to MICOM, fan protection function runs that performs 3 seconds ON 7 seconds OFF in five times. It occurs DC7~12V at the time of 3 seconds ON, it becomes below DC 2V at 7 seconds OFF.
Check and repair the fan motor self inferior, contact inferior of cord connection part

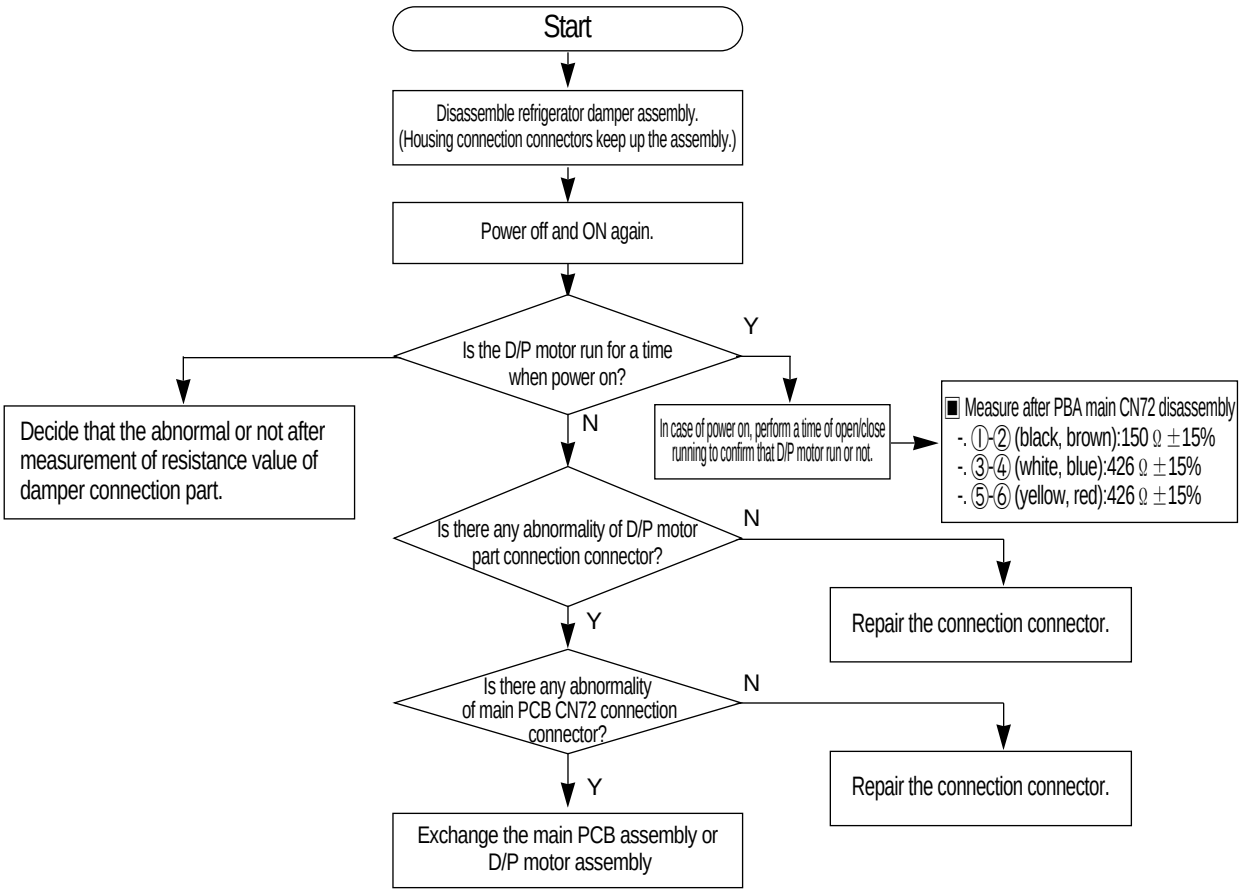
Reference

1) Refrigerator controls the refrigerator temperature by damper motor without fan motor.
2) Because the apparatus room fan motor is applied to the same BLDC fan with F-fan, Check it by reference to circuit diagram with the above method.

11-5. Refrigerator damper inferiority

Condition for decision

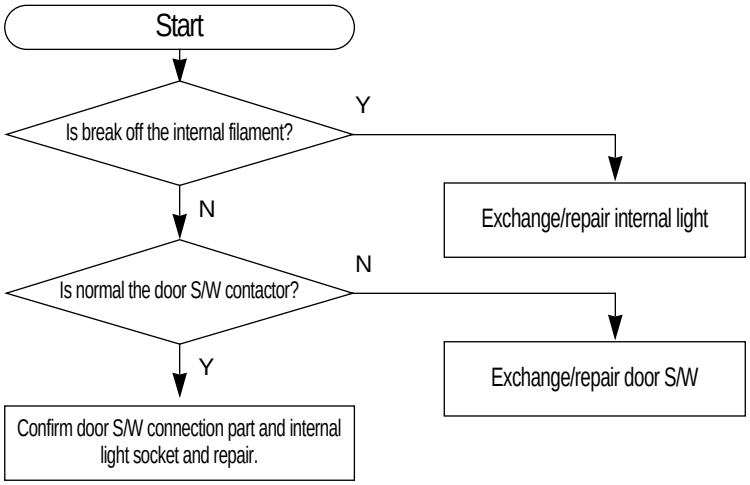
1) When D/P motor in refrigerator is failed, weak cooling and over cooling can be occurred.
2) If the inferiority is occurred at the state of D/P motor open, refrigerator is over cooling. And at the state of close, refrigerator is over cooling. In this()ases, it is the abnormality of refrigerator damper system. Refer to the followings.


Start
Disassemble refrigerator damper assembly.
(Housing connection connectors keep up the assembly.)
Power off and ON again.
Is the D/P motor run for a time when power on?
Y
N
Decide that the abnormal or not after measurement of resistance value of damper connection part.
In case of power on, perform a time of open/close running to confirm that D/P motor run or not.
■ Measure after PBA main CN72 disassembly
-. ①-② (black, brown):150 Ω ±15%
-. ③-④ (white, blue):426 Ω ±15%
-. ⑤-⑥ (yellow, red):426 Ω ±15%
Is there any abnormality of D/P motor part connection connector?
N
Repair the connection connector.
Y
Is there any abnormality of main PCB CN72 connection connector?
N
Repair the connection connector.
Y
Exchange the main PCB assembly or D/P motor assembly

Reference

1) Refrigerator D/P motor is composed of stepping motor.
2) It has not self diagnosis function because MICOM cannot detect an abnormal running of D/P motor.3. Among the damper running, signal by step cannot be measured by the general tester. So, confirm by naked eye the running state at the time of power on with reference to the above method and circuit diagram.

11-6. Internal light not lit.(Freezer, Refrigerator)

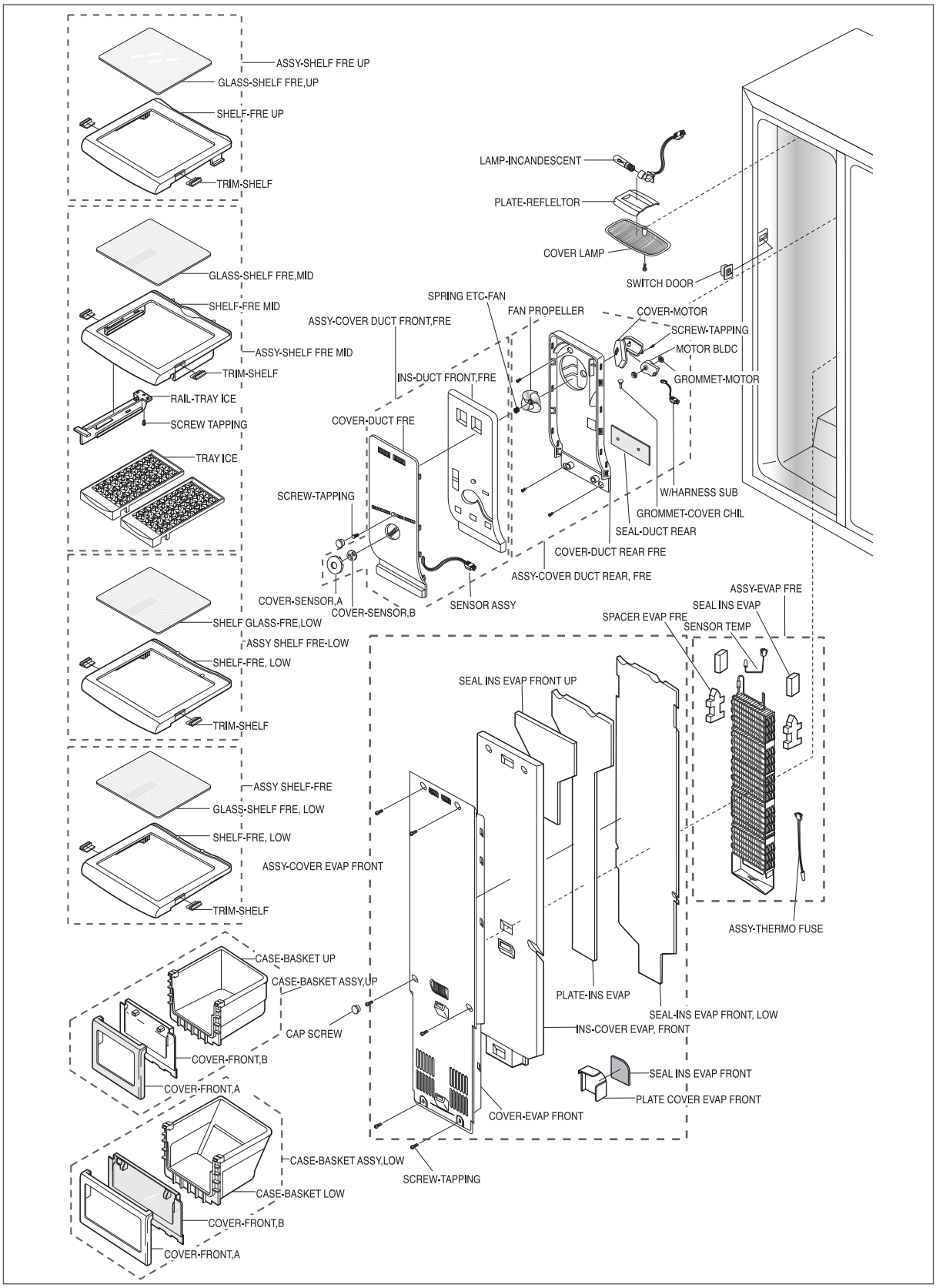


11-7. Circuit service materials list

NO	CODE-NO	Name of goods	Specification	Q'ty	Remarks
1	DA41-00113B	PBA MAIN ASS'Y	RS20N	1	
2	DA41-00114A	PBA PANEL ASS'Y	DC12V	1	
3	DA26-00009G	DC-TRANS	110V~115V/60Hz	1	
	DA26-00009F	DC-TRANS	230V~240V/50Hz	1	
	DA26-00009A	DC-TRANS	220V/50Hz	1	
	DA26-00009H	DC-TRANS	127V/60Hz	1	
4	DA32-10105V	R-ROOM SENSOR	PX41C(Blue)	1	
5	DA32-10109U	F-ROOM SENSOR	PX41C(Yellow)	1	
6	DA32-00006B	F-EVA SENSOR	PX41C(Yellow)	1	
7	DA32-10109T	EXIT SENSOR	PX41C(White)	1	

12. ILLSTRATED PARTS CATALOGUE

12-1. Parts of Freezer



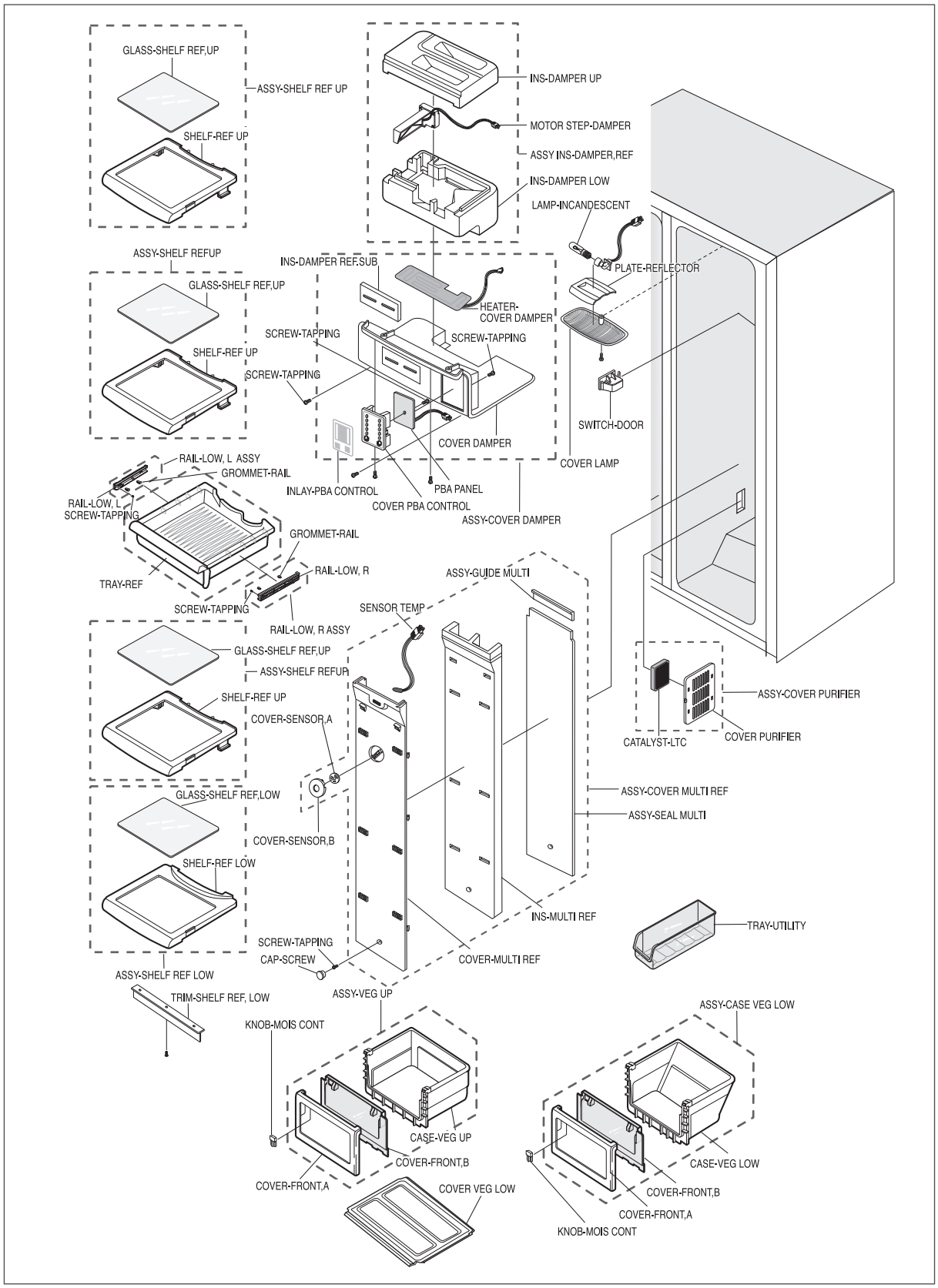
■ **Parts list of Freezer** (http://www.e4buyer.com/refrigerator)

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
1	DA97-00124A	ASSY-SHELF FRE UP	●	●	●	●	
1-1	DA64-00554A	GLASS-SHELF FRE,UP	●	●	●	●	
1-2	DA67-00644A	SHELF-FRE UP	●	●	●	●	
1-3	DA64-00090A	TRIM-SHELF	●	●	●	●	
2	DA97-00125A	ASSY-SHELF FRE MID	●	●	●	●	
2-1	DA64-00554B	GLASS-SHELF FRE,MID	●	●	●	●	
2-2	DA67-00645A	SHELF-FRE MID	●	●	●	●	
2-3	DA61-00519A	RAIL-TRAY ICE	●	●	●	●	
2-4	DA64-00090A	TRIM-SHELF	●	●	●	●	
2-5	DA63-01078A	TRAY ICE	●	●	●	●	
2-6	6002-000224	SCREW TAPPING	●	●	●	●	
3	DA67-00181B	ASSY SHELF FRE, LOW	●	●	●	●	
3-1	DA67-00177E	GLASS SHELF FRE, LOW	●	●	●	●	
3-2	DA67-00146A	SHELF-FRE, LOW	●	●	●	●	
3-3	DA64-00090A	TRIM-SHELF	●	●	●	●	
4	DA67-00181A	ASSY SHELF-FRE	●	●	●	●	
4-1	DA67-00177C	SHELF GLASS	●	●	●	●	
4-2	DA67-00146A	SHELF-FRE	●	●	●	●	
4-3	DA64-00090A	TRIM-SHELF	●	●	●	●	
5	DA67-00182A	CASE-BASKET ASSY,UP	●	●	●	●	
5-1	DA67-00150A	CASE-BASKET UP	●	●	●	●	
5-2	DA63-00174A	COVER-FRONT,B	●	●	●	●	
5-3	DA63-00170A	COVER-FRONT,A	●	●	●	●	
6	DA67-00183A	CASE-BASKET ASSY,LOW	●	●	●	●	
6-1	DA67-00151A	CASE-BASKET LOW	●	●	●	●	
6-2	DA63-00174A	COVER-FRONT,B	●	●	●	●	
6-3	DA63-00170A	COVER-FRONT,A	●	●	●	●	
7	DA67-30266D	CAP SCREW	●	●	●	●	
8	DA97-00128B	ASSY-COVER DUCT FRONT,FRE	●	●	●	●	
8-1	DA63-01085A	COVER-DUCT FRE	●	●	●	●	
8-2	DA62-00169A	DUCT FRONT,FRE	●	●	●	●	
8-3	DA32-10109U	SENSOR ASSY	●	●	●	●	
8-4	DA63-00798B	COVER-SENSOR,A	●	●	●	●	
8-5	DA63-00799A	COVER-SENSOR,B	●	●	●	●	
9	DA97-00153A	ASSY-COVER EVAP FRONT	●	●	●	●	
9-1	DA63-01061A	COVER-EVAP FRONT	●	●	●	●	
9-2	DA62-00164A	COVER EVAP FRONT	●	●	●	●	
9-3	DA61-00521A	PLATE-INS EVAP	●	●	●	●	
9-4	DA62-00259A	SEAL-INS EVAP FRONT, LOW	●	●	●	●	
9-5	DA61-00737A	PLATE COVER EVAP FRONT	●	●	●	●	
9-6	DA62-00182A	SEAL INS EVAP FRONT	●	●	●	●	
9-7	DA62-00260A	SEAL INS EVAP FRONT UP	●	●	●	●	

■ **Parts list of Freezer**

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
10	DA97-00129A	ASSY-COVER DUCT REAR, FRE	●	●	●	●	
10-1	DA63-01086A	COVER-DUCT REAR FRE	●	●	●	●	
10-2	DA63-00713B	COVER-MOTOR	●	●	●	●	
10-3	DA31-00020M	MOTOR BLDC	●	●	●	●	DC 12V
10-4	DA63-01146A	GROMMET-MOTOR	●	●	●	●	
10-5	DA39-00227A	W/HARNESS SUB	●	●	●	●	
10-6	DA31-00052A	FAN PROPELLER	●	●	●	●	
10-7	DA61-20128A	SPRING ETC-FAN	●	●	●	●	
10-8	6002-000480	SCREW-TAPPING	●	●	●	●	
10-9	DA62-00189A	SEAL-DUCT REAR	●	●	●	●	
10-10	DA63-40167A	GROMMET-COVER CHIL	●	●	●	●	
11	DA63-01075A	COVER LAMP	●	●	●	●	
12	DA61-00518A	PLATE-REFLELTOR	●	●	●	●	
13	4713-001147	LAMP-INCANDESCENT	●	●	●	●	110~127V, 25W
	4713-001145		●	●	●	●	220~230V, 30W
14	DA34-10120A	SWITCH DOOR	●	●	●	●	
15	DA96-00033B	ASSY-EVAP FRE	●	●	●	●	110V
	DA96-00033A		●	●	●	●	230V
	DA97-00155A		●	●	●	●	220V
	DA96-00033C		●	●	●	●	127V
15-1	DA47-10148M	ASSY-THERMO FUSE	●	●	●	●	
15-2	DA32-00006B	SENSOR TEMP	●	●	●	●	250V, 10A, 77℃
15-3	DA60-00042A	SPACER EVAP FRE	●	●	●	●	
15-4	DA62-00184A	SEAL INS EVAP	●	●	●	●	
16	6002-000215	SCREW-TAPPING	●	●	●	●	

12-2. Parts of Refrigerator



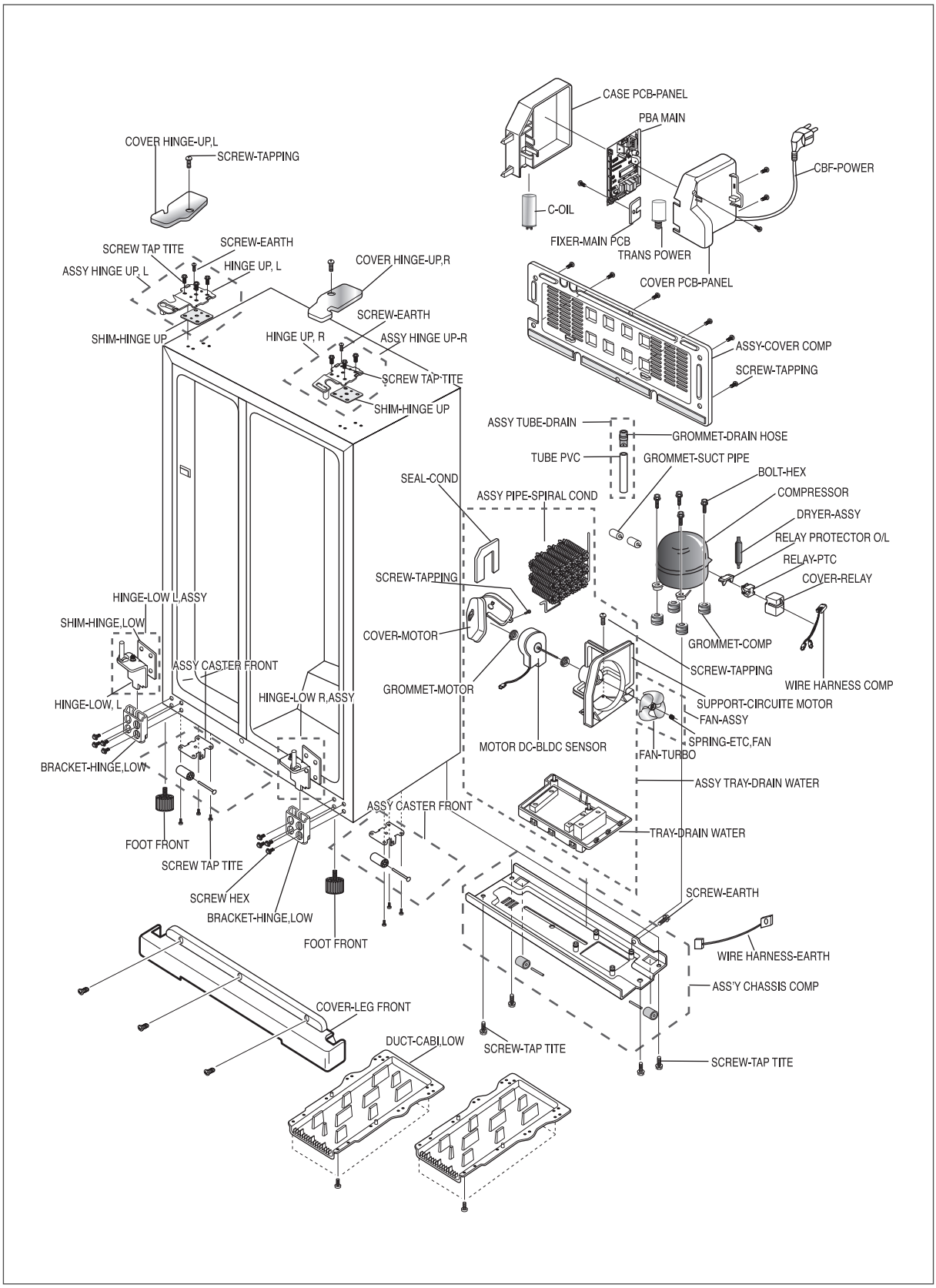
■ **Parts list of Refrigerator** (http://www.e4buyer.com/refrigerator)

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
1	DA97-00126B	ASSY-SHELF REF, UP	●	●	●	●	
1-1	DA64-00554C	GLASS-SHELF REF,UP	●	●	●	●	
1-2	DA67-00646A	SHELF-REF UP	●	●	●	●	
2	DA97-00126B	ASSY-SHELF REFUP	●	●	●	●	
2-1	DA64-00554C	GLASS-SHELF REF,UP	●	●	●	●	
2-2	DA67-00646A	SHELF-REF UP	●	●	●	●	
3	DA61-60183B	RAIL-LOW L, ASSY	●	●	●	●	
3-1	DA61-60179A	RAIL-LOW L	●	●	●	●	
3-2	DA63-40256B	GROMMET-RAIL	●	●	●	●	
4	DA61-60184B	RAIL-LOW R, ASSY	●	●	●	●	
4-1	DA61-60180A	RAIL-LOW R	●	●	●	●	
4-2	DA63-40256B	GROMMET-RAIL	●	●	●	●	
5	6002-000215	SCREW-TAPPING	●	●	●	●	
6	DA63-01074B	TRAY-REF	●	●	●	●	
7	DA97-00126B	ASSY-SHELF REFUP	●	●	●	●	
7-1	DA64-00554C	GLASS-SHELF REF,UP	●	●	●	●	
7-2	DA67-00646A	SHELF-REF UP	●	●	●	●	
8	DA97-00127B	ASSY-SHELF REF, LOW	●	●	●	●	
8-1	DA64-00554D	GLASS-SHELF REF,LOW	●	●	●	●	
8-2	DA67-00768A	SHELF-REF LOW	●	●	●	●	
8-3	DA64-00647A	TRIM-SHELF REF,LOW	●	●	●	●	
9	DA97-00118A	ASSY-VEG UP	●	●	●	●	
9-1	DA61-00507A	CASE-VEG UP	●	●	●	●	
9-2	DA63-01065A	COVER-FRONT,B	●	●	●	●	
9-3	DA63-01064A	COVER-FRONT,A	●	●	●	●	
9-4	DA64-00085A	KNOB-MOIS CONT	●	●	●	●	
10	DA97-00117A	ASSY-CASE VEG LOW	●	●	●	●	
10-1	DA61-00508A	CASE-VEG LOW	●	●	●	●	
10-2	DA63-01065A	COVER-FRONT,B	●	●	●	●	
10-3	DA63-01064A	COVER-FRONT,A	●	●	●	●	
10-4	DA64-00085A	KNOB-MOIS CONT	●	●	●	●	
11	DA97-00355C	ASSY INS-DAMPER,REF	●	●	●	●	
11-1	DA62-00166A	INS-DAMPER UP	●	●	●	●	
11-2	DA31-00043B	MOTOR STEP-DAMPER	●	●	●	●	
11-3	DA62-00167A	INS-DAMPER LOW	●	●	●	●	
12	DA97-00154C	ASSY-COVER DAMPER	●	●	●	●	110V
	DA97-00154B		●	●	●	●	230V
	DA97-00154A		●	●	●	●	220V
	DA97-00154D		●	●	●	●	127V
12-1	DA63-01073A	COVER DAMPER	●	●	●	●	
12-2	DA47-00106D	HEATER-COVER DAMPER	●	●	●	●	110V/60Hz
	DA47-00106B		●	●	●	●	230V/50Hz
	DA47-00106E		●	●	●	●	220V/50Hz
	DA47-00106C		●	●	●	●	127V/60Hz

■ **Parts list of Refrigerator**

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
12-3	DA62-00227A	INS-DAMPER REF.SUB	●	●	●	●	
12-4	DA41-00114A	PBA PANEL	●	●	●	●	
12-5	DA64-00557B	INLAY-PBA CONTROL	●	●	●	●	
12-6	6002-000319	SCREW-TAPPING	●	●	●	●	
12-7	6002-000213	SCREW-TAPPING	●	●	●	●	
12-8	DA63-01076A	COVER PBA CONTROL	●	●	●	●	
13	DA97-00120B	ASSY-COVER MULTI REF	●	●	●	●	
13-1	DA63-01087A	COVER-MULTI REF	●	●	●	●	
13-2	DA62-00170A	MULTI REF	●	●	●	●	
13-3	DA97-00589A	ASS'Y SEAL MULTI	●	●	●	●	
13-4	DA97-00588A	ASS'Y GUIDE MULTI	●	●	●	●	
13-5	DA32-10105V	SENSOR TEMP	●	●	●	●	
13-6	DA63-00798B	COVER-SENSOR,A	●	●	●	●	
13-7	DA63-00799A	COVER-SENSOR,B	●	●	●	●	
14	DA97-00152A	ASSY-COVER PURIFIER	●	●	●	●	
14-1	DA02-00057A	CATALYST-LTC	●	●	●	●	
14-2	DA63-01077A	COVER-PURIFIER	●	●	●	●	
15	DA67-40250E	TRAY-UTILITY	●	●	●	●	
16	DA63-01075A	COVER LAMP	●	●	●	●	
17	DA61-00518A	PLATE-REFLECTOR	●	●	●	●	
18	4713-001147	LAMP-INCANDESCENT	●	●	●	●	110~127V, 25W
	4713-001145		●	●	●	●	220~230V, 30W
19	DA34-10110B	SWITCH-DOOR	●	●	●	●	
20	DA67-30266D	CAP-SCREW	●	●	●	●	
21	6002-000215	SCREW-TAPPING	●	●	●	●	
22	DA63-01066A	COVER VEG LOW	●	●	●	●	

12-3. Parts of Unit



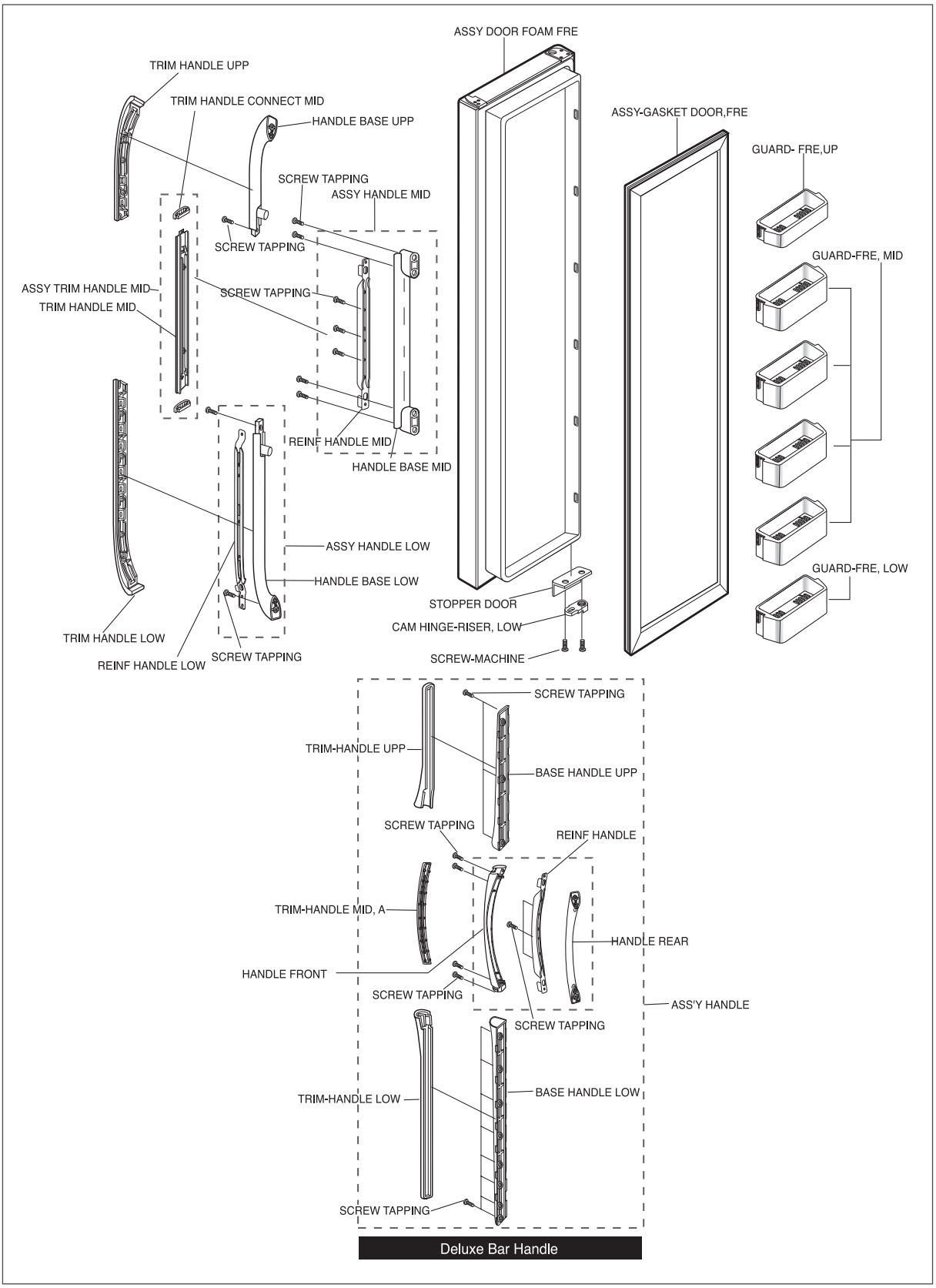
■ **Parts list of unit** (http://www.e4buyer.com/refrigerator)

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
1	DA63-00201B	COVER HINGE-UP,L	●	-	-	-	
	DA63-00201L		-	●	-	-	
2	DA61-00058C	ASSY HINGE UP-L	●	●	●	●	
2-1	DA61-00051D	HINGE-UP, L	●	●	●	●	
2-2	DA63-50192A	SHIM-HINGE,UP	●	●	●	●	
3	DA60-10004A	SCREW TAP TITE	●	●	●	●	
4	DA63-00200B	COVER HINGE-UP,R	●	-	-	-	
	DA63-00200L		-	●	-	-	
5	DA61-00058D	ASSY HINGE UP-R	●	●	●	●	
5-1	DA61-00052F	HINGE-UP, R	●	●	●	●	
5-2	DA63-50192A	SHIM-HINGE,UP	●	●	●	●	
6	DA61-00112F	HINGE-LOW L,ASSY	●	●	●	●	
6-1	DA63-50207C	SHIM-HINGE,LOW	●	●	●	●	
7	DA61-00317A	BRACKET-HINGE,LOW	●	●	●	●	
8	DA61-00111C	HINGE-LOW R,ASSY	●	●	●	●	
8-1	DA63-50207C	SHIM-HINGE,LOW	●	●	●	●	
9	DA61-30102C	FOOT FRONT	●	●	●	●	
10	DA61-00056A	ASSY CASTER FRONT	●	●	●	●	
11	DA60-10122C	SCREW TAP TITE	●	●	●	●	
12	6009-001255	SCREW HEX	●	●	●	●	
13	DA63-01062F	COVER-LEG FRONT	●	●	●	●	
14	DA61-00261A	CASE PCB-PANEL	●	●	●	●	
15	2501-001045	C-OIL	●	●	●	●	110V/60Hz,250VAC,12uF
	2501-001045		●	●	●	●	127V/60Hz,250VAC,12uF
	2501-001091		●	●	●	●	220V/50Hz,350VAC,5uF
	2501-001091		●	●	●	●	230V/50Hz,350VAC,5uF
16	DA41-00113A	PBA MAIN	●	●	●	●	
17	DA71-00155A	FIXER-MAIN PCB	●	●	●	●	
18	DA26-00009G	TRANS POWER	●	●	●	●	110,115V/60Hz
	DA26-00009H		●	●	●	●	127V/60Hz
	DA26-00009A		●	●	●	●	220V/50Hz
	DA26-00009F		●	●	●	●	230V/50Hz
19	DA63-00783A	COVER PCB-PANEL	●	●	●	●	
20		CBF-POWER	●	●	●	●	
21	DA97-00136A	ASSY-COVER COMP	●	●	●	●	
22	DA97-00359A	ASSY TUBE-DRAIN	●	●	●	●	
22-1	DA62-20001R	TUBE PVC	●	●	●	●	
22-2	DA63-00951C	GROMMET-DRAIN HOSE	●	●	●	●	
23	DA63-40171B	GROMMET-SUCT PIPE	●	●	●	●	
24	DA60-20008A	BOLT-HEX	●	●	●	●	
25	MK183CL2U/EH1	COMPRESSOR	●	●	●	●	110V/60Hz
	DK182PL2U/E01		●	●	●	●	127V/60Hz
	DK190KT2U/E01		●	●	●	●	220V/50Hz
	MK183QL2U/E01		●	●	●	●	230V/50Hz
26	DA63-40004A	GROMMET-COMP	●	●	●	●	

■ **Parts list of unit**

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
27	DA34-10003D	RELAY PROTECTOR O/L	●	●	●	●	110V/60Hz
	DA34-10003D		●	●	●	●	127V/60Hz
	DA34-10003U		●	●	●	●	220V/50Hz
	DA34-10003V		●	●	●	●	230V/50Hz
28	DA35-10013Q	RELAY-PTC	●	●	●	●	110V/60Hz
	DA35-10013Q		●	●	●	●	127V/60Hz
	DA35-10013E		●	●	●	●	220V/50Hz
	DA35-10013B		●	●	●	●	230V/50Hz
29	DA63-10352A	COVER-RELAY	●	●	●	●	
30	DA39-00084B	WIRE HARNESS,COMP	●	●	●	●	
31	DA73-30102B	DRYER-ASSY	●	●	●	●	
32	6002-000213	SCREW-TAPPING	●	●	●	●	
33	DA60-10124A	SCREW-TAP TITE	●	●	●	●	
34	DA60-10107A	SCREW-EARTH	●	●	●	●	
35	DA39-20389E	WIRE HARNESS-EARTH	●	●	●	●	
36	DA97-00367C	ASSY TRAY-DRAIN WATER	●	●	●	●	
36-1	DA97-00259C	ASSY PIPE-SPIRAL COND	●	●	●	●	
36-2	DA63-00713A	COVER-MOTOR	●	●	●	●	
36-3	DA63-01146A	GROMMET-MOTOR	●	●	●	●	
36-4	DA31-00020H	MOTOR DC-BLDC SENSOR	●	●	●	●	DC12V
36-5	DA61-00415A	SUPPORT-CIRCUITE MOTOR	●	●	●	●	
36-6	DA66-00034A	TRAY-DRAIN WATER	●	●	●	●	
36-7	DA72-00176A	SEAL-COND	●	●	●	●	
36-8	6002-000227	SCREW-TAPPING	●	●	●	●	
36-9	6002-000213	SCREW-TAPPING	●	●	●	●	
37	DA31-00010D	FAN-ASS'Y	●	●	●	●	
37-1	DA31-00015C	FAN-TURBO	●	●	●	●	
37-2	DA61-20128A	SPRING-ETC,FAN	●	●	●	●	
38	DA97-00133B	ASS'Y CHASSIS COMP	●	●	●	●	
39	DA67-00642A	DUCT-CABI, LOW	●	●	●	●	

12-4. Parts of the freezer door



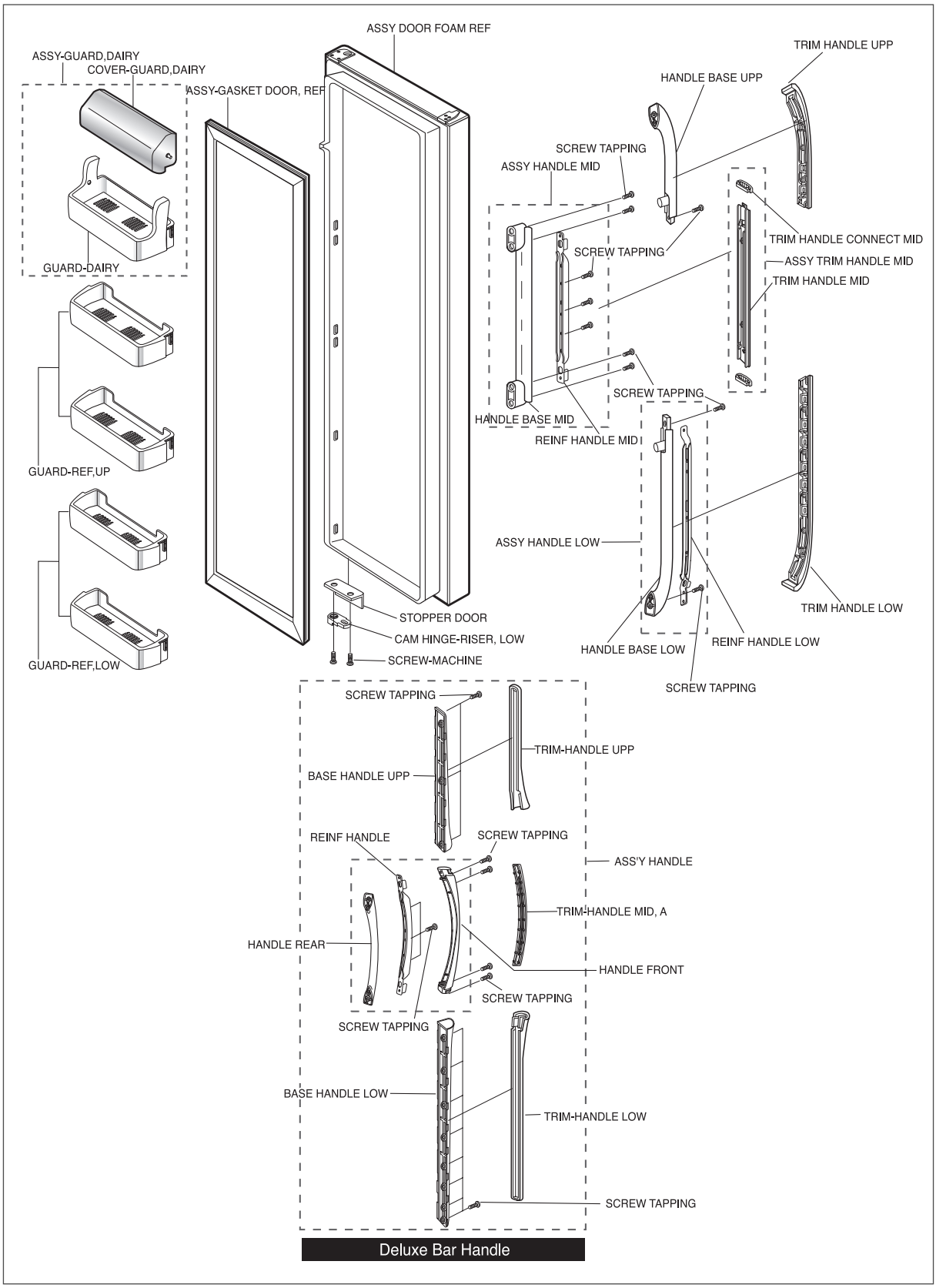
■ **Parts list of the freezer door** (http://www.e4buyer.com/refrigerator)

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
1	DA91-01516B	ASSY DOOR FOAM FRE	●	-	-	-	STS-LOOKING
	DA91-01516G		-	●	-	-	SNOW-WHITE
	DA91-01516F		-	-	●	-	STS-LOOKING
	DA91-01516N		-	-	-	●	SNOW-WHITE
2	DA97-00178A	ASSY-GASKET DOOR,FRE	●	●	●	●	
3	DA63-00171A	GUARD-BOTTLE FRE,MID	●	●	●	●	
4	DA63-00171D	GUARD-BOTTLE FRE,LOW	●	●	●	●	
5	DA63-00213A	GUARD-FRE-UPP	●	●	●	●	
6	6002-000468	SCREW-TAPPING	●	●	●	●	
7	6001-000716	SCREW-MACHINE	●	●	●	●	
8	DA61-00776A	STOPPER DOOR	●	●	●	●	
9	DA66-90112C	CAM HINGE-RISER, LOW	●	●	●	●	
10	6001-000716	SCREW-MACHINE	●	●	●	●	
11	DA64-00110B	ASSY HANDLE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00110C		-	●	-	-	SKI-BAR HANDLE
11-1	DA64-00096B	HANDLE BASE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00096C		-	●	-	-	SKI-BAR HANDLE
11-2	DA71-00077A	REINF HANDLE MID	●	●	-	-	
11-3	6002-000470	SCREW TAPPING	●	●	-	-	
12	6002-000468	SCREW TAPPING	●	●	-	-	
13	DA64-00097B	HANDLE BASE UPP	●	-	-	-	SKI-BAR HANDLE
	DA64-00097C		-	●	-	-	SKI-BAR HANDLE
14	DA97-00654B	ASSY HANDLE LOW	●	-	-	-	SKI-BAR HANDLE
	DA97-00654C		-	●	-	-	SKI-BAR HANDLE
14-1	DA61-00511A	REINF HANDLE LOW	●	●	-	-	
14-2	6002-000470	SCREW TAPPING	●	●	-	-	
15	6002-000213	SCREW TAPPING	●	●	-	-	
16	DA64-00209A	ASSY TRIM HANDLE MID	●	●	-	-	SKI-BAR HANDLE
16-1	DA64-00098H	TRIM HANDLE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00098B		-	●	-	-	SKI-BAR HANDLE
16-2	DA64-00196A	TRIM HANDLE CONNECT MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00196B		-	●	-	-	SKI-BAR HANDLE
17	DA64-00100L	TRIM HANDLE UPP	●	-	-	-	SKI-BAR HANDLE
	DA64-00100A		-	●	-	-	SKI-BAR HANDLE
18	DA64-00543B	TRIM HANDLE LOW	-	-	-	-	SKI-BAR HANDLE
	DA64-00543C		-	-	-	-	SKI-BAR HANDLE
19	DA64-00379B	ASS'Y HANDLE	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00379C		-	-	●	-	DELUXE-BAR HANDLE
19-1	DA64-00328B	HANDLE REAR	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00328C		-	-	●	-	DELUXE-BAR HANDLE
19-2	DA71-00280A	REINF HANDLE	-	-	●	●	
19-3	6002-000213	SCREW TAPPING	-	-	●	●	
19-4	DA64-00329B	HANDLE FRONT	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00329C		-	-	●	-	DELUXE-BAR HANDLE
20	DA64-00371B	BASE HANDLE UPP	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00371C		-	-	●	-	DELUXE-BAR HANDLE

■ **Parts list of the freezer door**

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
21	DA64-00547B	BASE HANDLE LOW	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00547C		-	-	●	-	DELUXE-BAR HANDLE
22	6002-001122	SCREW TAPPING	-	-	●	●	
23	DA64-00326B	TRIM-HANDLE UPP	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00326C		-	-	●	-	DELUXE-BAR HANDLE
24	DA64-00544B	TRIM-HANDLE LOW	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00544C		-	-	●	-	DELUXE-BAR HANDLE
25	6002-000468	SCREW TAPPING	-	-	●	●	
26	DA64-00324B	TRIM-HANDLE MID, A	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00324C		-	-	●	-	DELUXE-BAR HANDLE

12-5. Parts of the refrigerator door



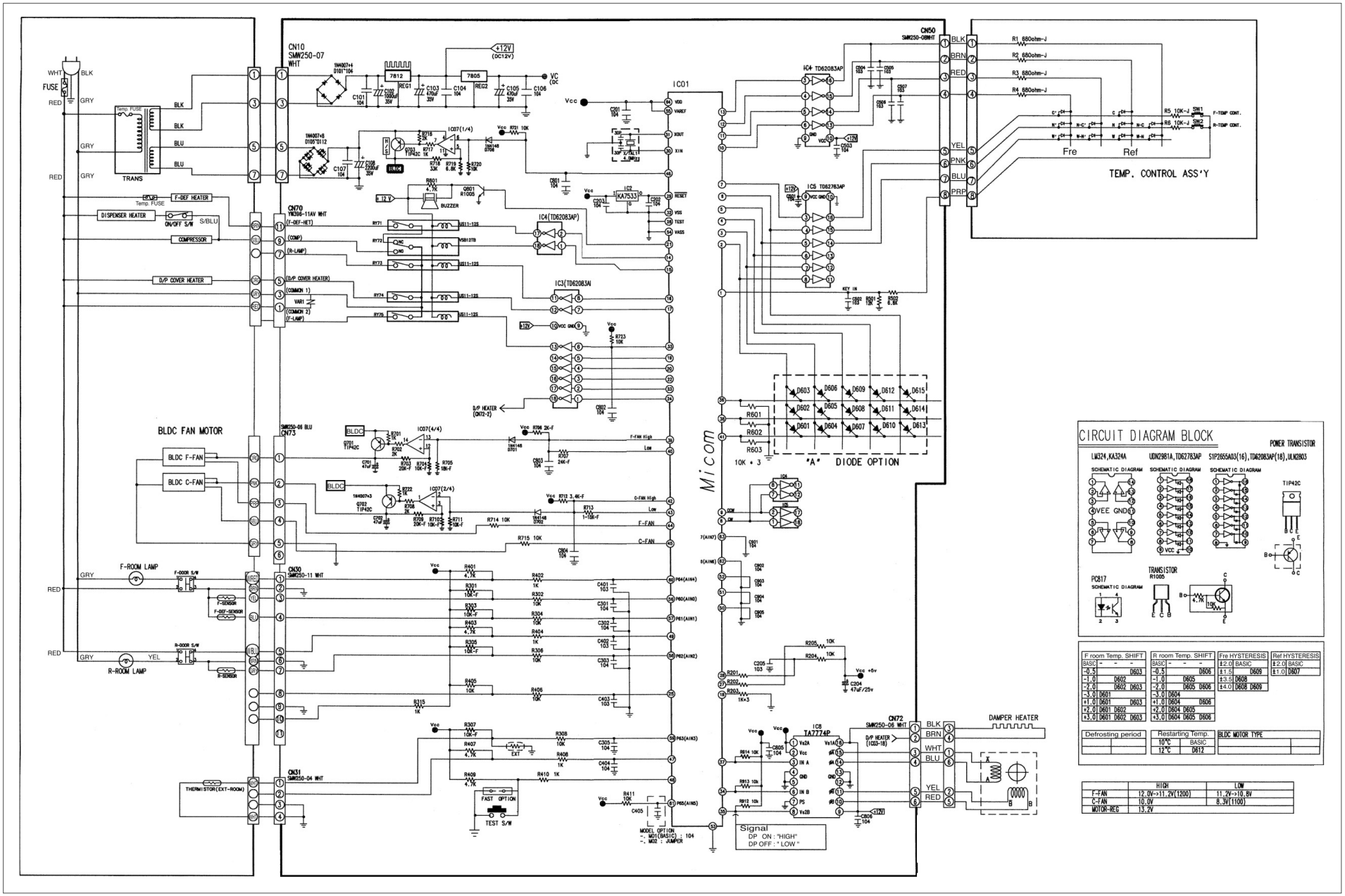
■ **Parts list of the refrigerator door** (http://www.e4buyer.com/refrigerator)

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
1	DA91-01517B	ASSY DOOR FOAM REF	●	-	-	-	STS-LOOKING
	DA91-01517G		-	●	-	-	SNOW-WHITE
	DA91-01517F		-	-	●	-	STS-LOOKING
	DA91-01517N		-	-	-	●	SNOW-WHITE
2	DA97-00179A	ASSY-GASKET DOOR, REF	●	●	●	●	
3	DA97-00732A	ASSY-GUARD,DAIRY	●	●	●	●	
4	DA63-01067B	COVER-GUARD,DAIRY	●	●	●	●	
5	DA63-01068A	GUARD-DAIRY	●	●	●	●	
6	DA63-01069A	GUARD-REF,UP	●	●	●	●	
7	DA63-10170A	GUARD-REF,LOW	●	●	●	●	
8	6002-000468	SCREW-TAPPING	●	●	●	●	
9	6001-000716	SCREW-MACHINE	●	●	●	●	
10	DA61-00776A	STOPPER DOOR	●	●	●	●	
11	DA66-90112C	CAM HINGE-RISER, LOW	●	●	-	-	
12	6001-000716	SCREW-MACHINE	●	●	-	-	
13	DA64-00110B	ASSY HANDLE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00110C		-	●	-	-	SKI-BAR HANDLE
13-1	DA64-00096B	HANDLE BASE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00096C		-	●	-	-	SKI-BAR HANDLE
13-2	DA71-00077A	REINF HANDLE MID	●	●	-	-	
13-3	6002-000470	SCREW TAPPING	●	●	-	-	
14	6002-000468	SCREW TAPPING	●	●	-	-	
15	DA64-00097B	HANDLE BASE UPP	●	-	-	-	SKI-BAR HANDLE
	DA64-00097C		-	●	-	-	SKI-BAR HANDLE
16	DA97-00654B	ASSY HANDLE LOW	●	-	-	-	SKI-BAR HANDLE
	DA97-00654C		-	●	-	-	
16-1	DA61-00511A	REINF HANDLE LOW	●	●	-	-	
16-2	6002-000470	SCREW TAPPING	●	●	-	-	
17	6002-000213	SCREW TAPPING	●	●	-	-	SKI-BAR HANDLE
18	DA64-00209A	ASSY TRIM HANDLE MID	●	●	-	-	SKI-BAR HANDLE
18-1	DA64-00098H	TRIM HANDLE MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00098B		-	●	-	-	SKI-BAR HANDLE
18-2	DA64-00196A	TRIM HANDLE CONNECT MID	●	-	-	-	SKI-BAR HANDLE
	DA64-00196B		-	●	-	-	SKI-BAR HANDLE
19	DA64-00100L	TRIM HANDLE UPP	●	-	-	-	SKI-BAR HANDLE
	DA64-00100A		-	●	-	-	SKI-BAR HANDLE
20	DA64-00543B	TRIM HANDLE LOW	●	-	-	-	
	DA64-00543C		-	●	-	-	DELUXE-BAR HANDLE
21	DA64-00379B	ASS'Y HANDLE	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00379C		-	-	●	-	DELUXE-BAR HANDLE
21-1	DA64-00328B	HANDLE REAR	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00328C		-	-	●	-	
21-2	DA71-00280A	REINF HANDLE	-	-	●	●	
21-3	6002-000213	SCREW TAPPING	-	-	●	●	DELUXE-BAR HANDLE
21-4	DA64-00329B	HANDLE FRONT	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00329C		-	-	●	-	DELUXE-BAR HANDLE

■ Parts list of the refrigerator door

NO	CODE-NO	Name of goods	RS20N***				Specification
			CSL	CSW	ESL	ESW	
22	DA64-00371B	BASE HANDLE UPP	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00371C		-	-	●	-	DELUXE-BAR HANDLE
23	DA64-00547B	BASE HANDLE LOW	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00547C		-	-	●	-	DELUXE-BAR HANDLE
24	6002-001122	SCREW TAPPING	-	-	●	●	
25	DA64-00326B	TRIM-HANDLE UPP	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00326C		-	-	●	-	DELUXE-BAR HANDLE
26	DA64-00544B	TRIM-HANDLE LOW	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00544C		-	-	●	-	DELUXE-BAR HANDLE
27	6002-000468	SCREW TAPPING	-	-	●	●	
28	DA64-00324B	TRIM-HANDLE MID, A	-	-	-	●	DELUXE-BAR HANDLE
	DA64-00324C		-	-	●	-	DELUXE-BAR HANDLE

Appendix Ⅰ (RS20N for Circuit Diagram)



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